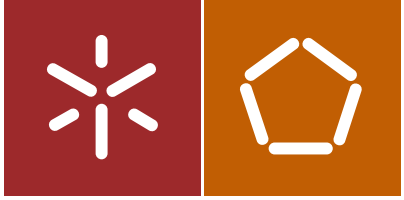
Universidade do Minho
Escola de Engenharia

Fernando Paulo dos Santos Rodrigues Belfo

Influence of Incentive Policy in the Alignment of Business and Information Technology

Julho de 2016

Influence of Incentive Policy in the Alignment of Business and Information Technology
Fernando Belfo
UMinho | 2016



Universidade do Minho
Escola de Engenharia

Fernando Paulo dos Santos Rodrigues Belfo

Influence of Incentive Policy in the Alignment of Business and Information Technology

Tese de Doutoramento
Tecnologias e Sistemas de Informação

Trabalho efectuado sob a orientação do
Professor Doutor Rui Dinis Sousa

Julho de 2016

STATEMENT OF INTEGRITY

I hereby declare having conducted my thesis with integrity. I confirm that I have not used plagiarism or any form of falsification of results in the process of the thesis elaboration.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

University of Minho, 26/JUL/2016

Fernando Paulo dos Santos Rodrigues Belfo

(Signature)

To Gabriela, the love of my life
À Gabriela, o amor da minha vida

To my parents, Cristóvão and Amália, my inspiration
Aos meus pais, Cristóvão e Amália, a minha fonte de inspiração

AGRADECIMENTOS

Em primeiro lugar, o meu louvor e graças a Deus. Pela Sua orientação divina em todo o meu trabalho de investigação e também por tudo o que Ele tornou possível durante toda a minha vida. Eu sinto que tenho sido uma pessoa privilegiada.

Este trabalho de dissertação é dedicado à minha companheira e grande amor Gabriela, a qual se dedicou e se sacrificou tanto para que eu pudesse ter as melhores condições possíveis para concretizar este projeto. Ela apoiou constantemente os meus objetivos e sonhos de uma forma incondicional, dando-me sempre força para continuar. Dedico também este trabalho aos meus pais, Cristóvão e Amália, que sempre me inspiraram e apoiaram ao longo de toda a minha vida, em especial no que se refere à minha educação. Na realidade, eles tornaram este projeto menos difícil. Os três são a grande motivação na minha vida e estas palavras são excassas para exprimir o que sinto.

Gostaria também de expressar um agradecimento especial e sincero ao meu orientador, o Professor Rui Dinis Sousa, pela sua ajuda competente, comprometida e infinita paciência, encontrando sempre tempo para lidar com a minha dissertação, mesmo quando o momento não era o mais oportuno. Não tenho dúvidas de que a qualidade deste trabalho não seria a mesma sem a sua ajuda.

Gostaria igualmente de agradecer a todos os meus professores da Universidade do Minho. Cada um, à sua maneira, contribuiram para o meu conhecimento. Devo destacar aqui, o Professor João Álvaro Carvalho, por sempre ter levantado questões relevantes, desafiando-me a ver por perspetivas diferentes e por colocar muitas vezes em causa o que por vezes parece tão certo. Além disso, os meus agradecimentos aos meus colegas do programa de doutoramento dos Sistemas de Tecnologia e Informação da Faculdade, pela sua companhia, por compartilharem os seus conhecimentos comigo, pela troca livre de ideias e pelos grandes momentos que passamos juntos.

Além do mais, o instrumento adotado nesta investigação baseou-se no conselho do grupo de eminentes especialistas convidados a participar na fase de pré-teste. Este trabalho não seria o mesmo sem a sua ajuda e disponibilidade, opiniões e sugestões. Adicionalmente, eu gostaria de registar a minha gratidão à empresa Informa D&B (Dun & Bradstreet) pela sua colaboração e por me ter fornecido a base de dados de empresas e contatos que foram fundamentais para esta investigação. Por terem sido uma parte indispensável, gostaria também de agradecer a todos os gestores que responderam ao inquérito, muitas vezes sacrificando o pouco tempo disponível que tinham. Os meus agradecimentos a todos eles pela sua disponibilidade e importante contribuição.

Quero ainda agradecer ao Instituto Superior de Contabilidade e Administração de Coimbra, pelas condições materiais e humanas que me possibilitou, à Fundação para a Ciência e a Tecnologia, pela bolsa de doutoramento proporcionada, e ao Centro de Investigação ALGORITMI da Universidade do Minho, pelo apoio financeiro na participação em conferências, enquanto seu membro colaborador.

Para terminar, mas não menos importante, quero agradecer à D. Manuela Oliveira, que, nas minhas deslocações a esse Minho encantador, me recebeu e acolheu inúmeras vezes em sua casa, como se de um filho se tratasse. Deixo igualmente aqui uma palavra de apreço à Manuela Oliveira (filha) por se ter disponibilizado a ler e a rever o texto desta tese.

ACKNOWLEDGMENTS

First and foremost, praises and thanks to God. For His divine guidance throughout my research work and also for everything He made possible throughout all my life. I feel I have been a privileged person.

This dissertation research is dedicated to my companion and great love Gabriela, who dedicated herself so much and sacrificed herself so that I could have the best possible conditions to realize this project. She has always unconditionally supported my goals and dreams, giving me strength to continue everytime. To my parents, Cristóvão and Amália, who always inspired me on throughout my life and have supported me, especially in what concerns my education. In fact, they made this project less difficult. The three of them are the main motivation of my life and my words are insufficient to express my feelings.

I also wish to express an especial and sincere appreciation to my advisor, the Professor Rui Dinis Sousa, for his competent and committed help and for his endless patience, which found time to deal with my dissertation even when it was not at an opportune time. I have no doubt that the quality of this work would not be the same without his collaboration.

I would also like to thank all my professors at the University of Minho. Each one, in its own way, contributed to increase my knowledge. Here, I must point out Professor João Alvaro Carvalho, for having always raised relevant remarks, challenging me to see with other lenses and, often, calling into question what sometimes seems so right. Also, my thanks to my collegues of the Doctoral Program of Technology and Information Systems at the faculty for their companionship, by sharing their knowledge with me, for the independent exchange of ideas and for the great moments we spent together.

Furthermore, the instrument adopted in this research came out of the advice of the group of eminent experts invited to participate at the pre-test phase. This work wouldn't be the same without their help and availability, opinions and suggestions. Aditionally, I would like to register my thankfulness to the Informa D&B (Dun & Bradstreet) company for its collaboration and by providing me with a database of companies and contacts that were fundamental to this research. Moreover, because they were an indispensable part, I would like to thank all those managers that answered the survey, often sacrificing the little available time they had. I express my gratitude to all of them for their important availability and contribution.

I also want to thank the Institute of Accounting and Administration of Coimbra (ISCAC), for all the material and human conditions that enabled me, the Foundation for Science and Technology (FCT) for the doctoral fellowship that provided me and also the research Centre ALGORITMI at the University of Minho, for the financial support it gave me to participate in conferences, as a collaborator member.

Lastly, but not least, I thank to D. Manuela Oliveira, who, on my visits to this lovely Minho, greeted and welcomed me countless times in her home as if I was her son. Moreover, I leave a word of appreciation to Manuela Oliveira (daughter) for being available to read and review the text of this thesis.

“The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency. The second is that automation applied to an inefficient operation will magnify the inefficiency.”

Bill Gates

RESUMO

Os executivos de topo de muitas das maiores empresas mundiais estão hoje conscientes de que as novas tecnologias estão a redefinir as cadeias de valor e que as suas empresas precisam de permanecer atentas para continuarem relevantes no mercado. Os negócios modernos precisam de articular as necessidades do negócio com tecnologias de informação (TI) inovadoras. De facto, a necessidade de um melhor alinhamento entre o negócio e as TI tem sido continuamente considerado como uma das maiores preocupações que executivos de topo de TI enfrentam. Esta preocupação é talvez apoiada na convicção, suportada em um número significativo de estudos, de que um melhor alinhamento pode influenciar positivamente o desempenho do negócio. Na verdade, este alinhamento é considerado uma das áreas mais importantes da governação das TI e a sua importância é reconhecida e abordada por alguns dos mais importantes normativos das TI, como o COBIT, o ITIL ou o TOGAF. Embora o alinhamento tenha sido abordado por muitos estudos no passado, a preocupação constante com ele na última década sugere que não tem havido progresso suficiente sobre esta questão. Por outro lado, o alinhamento é feito por pessoas. E, quanto mais as pessoas estiverem motivadas nas organizações, mais e melhor elas trabalham. A influência que os incentivos de alguns gestores têm no seu comportamento e, assim, na sua atividade e produtividade profissional tem sido bastante abordada na literatura. Na verdade, é habitual as empresas darem pacotes de incentivos aos seus gestores, desejavelmente concebidos para serem alinhados com os objetivos organizacionais. Este trabalho investigou a influência de políticas de incentivo na promoção de um melhor alinhamento. Além da revisão da literatura mais importante sobre estas duas áreas, foi proposto um novo modelo que relaciona o incentivo com o alinhamento do negócio e das TI. É proposto e aplicado um novo instrumento para medir o nível de incentivo de uma organização e também adaptado e aplicado um instrumento existente para medir o nível de alinhamento. Após algumas fases prévias, como pré-teste e teste piloto, os instrumentos foram aplicados na amostra completa, através duma plataforma de inquéritos *online*. A amostra, provida pela Informa Dun & Bradstreet, foi expandida com base na rede social LinkedIn, suportada no método "bola de neve", que ajuda o estudo de populações difíceis de alcançar. Foram recolhidas respostas de mais de quatro centenas de gestores de negócio e TI, de mais de duas centenas de médias e grandes empresas portuguesas, representando, ao que se sabe, o inquérito mais vasto já feito em Portugal sobre alinhamento. O modelo, de componentes hierárquicas, foi estimado usando um modelo de equações estruturais (SEM) com a técnica dos mínimos quadrados parciais (PLS). A confiabilidade e validade do modelo de medida (reflexivo) foram garantidas depois de descartados alguns indicadores. A avaliação dos componentes de ordem superior do modelo (formativo) foi assegurada por uma sólida validação de conteúdo dos constructos "incentivo" e "alinhamento". Os resultados principais são apresentados, discutidos e interpretados através de vários ângulos, respetivamente, a área funcional dos respondentes, o seu género, a sua geração, a atividade económica das empresas, por cada variável manifesta do incentivo e alinhamento e dimensão das empresas. Por fim, os resultados do modelo proposto são discutidos e interpretados. Ao propor uma explicação do alinhamento com uma única variável, o incentivo, este é talvez um dos modelos mais parcimoniosos do alinhamento apresentados até agora. Este estudo também permite suportar aquele que é, talvez, o seu maior contributo, que é facto do incentivo explicar a maior parte do alinhamento. Algumas recomendações para a prática e para investigação futura são ainda propostas.

ABSTRACT

The chief executive officers from many of world's largest companies are aware that new technologies are redefining value chains and that companies need to remain aware to remain relevant in the market. The modern businesses need to articulate business needs with innovative information technologies. In fact, business and IT alignment (BIA) has been continually considered as one of most important concerns that top IT executives face. This concern is probably supported on the conviction, sustained on a significant number of studies, that achieving a better alignment can positively influence business performance. Actually, this alignment is considered one of most important areas of IT governance and its importance is recognized and addressed by some of most important IT frameworks, as COBIT, ITIL or TOGAF. Although alignment has been focused by numerous researches in the past, the ongoing concern with it in the last decade suggests that there was not been sufficient progress in addressing this issue. Still, the allignment is made by people. And, the more people are motivated in organizations, the more and better they work. The influence that incentives have on managers behaviour and, thus, on their professional activity and productivity has been widely addressed in the literature. Indeed, it is a common practice among companies giving packages of incentives to their executives, desirably designed in order to be aligned with organization objectives. This work investigated the influence of incentive policies to promote a better alignment. Besides reviewing most important literature about these two areas, this study proposes a new model that relates the incentive with the alignment of business and IT. It proposed and applied a new instrument to measure the incentive maturity of an organization and it also adapted and applied an existing instrument to measure the alignment maturity. After some preceding phases, as pretesting and pilot testing, the instruments were administered on a full scale sample, through an online survey platform. The sample, provided by Informa Dun & Bradstreet, was expanded with the help of the social network LinkedIn, supported in the snowball method, which helps on the study of hard-to-reach populations. Responses were collected from more than four hundred business and IT managers, from more than two hundred medium-size and large Portuguese companies, representing, as far as is known, the wider survey ever done in Portugal about the alignment between business and IT. The model, a hierarchical component model, was estimated using a structural equation model (SEM) with partial least squares technique (PLS). The reliability and validity of the measurement model (reflective) were guaranteed, after some indicators have been discarded. The model assessment concerning the higher-order components (formative) was assured through robust content validity procedures of incentive and alignment constructs. The major findings are presented, discussed and interpreted by different angles, respectively, by the functional area of respondents, by respondents' gender, by respondents' generation, by companies' economic activity, by each one of the manifest variables of incentive and alignment and by companies' size. Finally, the results of the proposed model are discussed and interpreted. By proposing an explanation of alignment with just one latent variable, the incentive, this is probably one of the most parsimonious models of alignment presented until now. The study also allows supporting the one that is perhaps its greatest contribution, which is the fact that the majority of the explanation of alignment is made by incentive. Some recommendations for practice and future research are also proposed.

INDEX

INDEX OF FIGURES

INDEX OF TABLES

INDEX OF EQUATIONS

LIST OF ABBREVIATIONS, ACRONYMS AND INITIALISMS

AIS .....Association for Information Systems

AMAM .....Alignment Metamodel Assessment Method

ANCOVA .....ANalysis of COVAriance

ANOVA .....Analysis of Variance

ATM .....Automated Teller Machine

AVE .....Average Variance Extracted

BIA.....Business and Information technology Alignment

BPM.....Business Process Management

BSC .....Balanced ScoreCard

CEO .....Chief Executive Officer

CFA.....Confirmatory Factor Analysis

CFO.....Chief Financial Officer

CH .....Conceptual Hypotheses

CIO .....Chief Information Officer

COBIT .....Control Objectives for Information and related Technology

DCS .....Dependent Care Support

DV.....Dependent Variable

EA.....Enterprise Architecture

EFA .....Exploratory Factor Analysis

EPE.....*Entidade Pública Empresarial*

ERG.....Existence, Relatedness and Growth

EU.....European Union

EVA .....Economic Value Added

FEBS .....Federal Employee Benefits Survey

FCT.....*Fundação para a Ciência e a Tecnologia*

GUI .....Graphical User Interface

HOC.....Higher-Order Component

LOC.....Lower-Order Component

HR .....Human Resources

iCS.....Intelligence Compliance Solutions

ICT .....Information and Communications Technology

ICTC.....Information and Communications Technology Council

IEC .....International Electrotechnical Commission

IEEE.....Institute of Electrical and Electronics Engineers

IF .....Impact Factor

INSEAD .....INStitut Européen d'ADministration des affaires

IPQ .....Instituto Português de Qualidade

IS .....Information System

ISCAC.....Instituto Superior de Contabilidade e Administração de Coimbra

ISO.....International Organization for Standardization

IT .....Information Technology

ITIL.....Information and Technology Infrastructure Library

IV .....Independent Variable

LISREL .....LInear Structural RELationships

LSE .....Large Scale Enterprise

NASI.....National Academy of Social Insurance

NumXL.....Numerical Analysis for Excel

NRI .....Networked Readiness Index

OECD.....Organisation for Economic Co-operation and Development

OH .....Operative Hypotheses

OLAP.....OnLine Analytical Processing

OLTP.....OnLine Transactional Processing

OPM .....Office of Personnel Management

PPE.....Post-Project Evaluation

PROTEC .....*PROgrama de apoio à formação avançada de docentes do Ensino Superior PoliTÉCnico*

ROA.....Return On Assets

ROI.....Return On Investment

SAIT .....Strategic Alignment of Information Technologies

SAM .....Strategic Alignment Model

SBIAT.....Strategic Business and IT Alignment

SEM .....Structural Equation Modeling

SIBS .....Sociedade Interbancária de Serviços S.A.

SISP.....Strategic Information System Planning

SLA .....Service Level Agreement

SME .....Small and Medium-sized Enterprise

SOA.....Service Oriented Architecture

SSE.....Sum of the Squared Errors

SSO.....Sum of the Squared Observations

SSC.....Shared Services Center

TOGAF.....The Open Group Architecture Framework

TCO .....Total Costs of Ownership

UI.....Unemployment Insurance

UNICEF .....United Nations Children's Fund

USA.....United States of America

UK.....United Kingdom

VIF .....Variance Inflation Factor

WEF .....World Economic Forum

WW2 .....World War II

1 INTRODUCTION

1.1 Information technologies

Technology extends human abilities. The American Association for the Advancement of Science enlightened this idea (Project 2061, 1989) by saying:

> *"Compared with other species, we are nothing special when it comes to speed, agility, strength, stamina, vision, hearing, or the ability to withstand extremes of environmental conditions. A variety of technologies, however, improves our ability to interact with the physical world. In a sense, our inventions have helped us make up for our biological disadvantages."*

The possibilities of Information and Communications Technologies (ICTs) are huge since, through the enhancement of productivity and reducing transaction and information costs, they allow the creation of economic opportunities and the promotion of the social and political inclusion. An annual research promoted by the World Economic Forum (WEF) and the INSEAD (the original acronym for the French business school "INStitut Européen d'ADministration des affaires") about the ICTs role on global growth, reveals the growing importance of technology and innovation across the world, measured by the Networked Readiness Index (NRI). NRI is an index defined by these two institutions to measure economies in terms of their capacity to prepare for, use and leverage ICT, with 10 pillars (with the first pillar as being the political and regulatory environment, to social impacts, as the tenth pillar) (WEF & INSEAD, 2015).

As it was evidenced at this study, the ICTs are vectors of economic and social transformation, but its impact extends well beyond productivity gains. According to the 2015 study and its NRI index, the social impacts ICTs have on its economy and society seem to be perfectly correlated with a country's level of ICT usage. The top 30 places of the 2015 NRI index of a total of 143 economies, were dominated by high-income countries, led by Singapore, the country with the highest penetration of mobile broadband subscriptions per capita in the world, where more than half of the population is employed in knowledge-intensive jobs and where its government has a clear digital strategy with great online services and e-participation tools. The rest of the top ten countries in the 2015 report were again dominated by Western European and Asian advanced economies. The second place on this list is occupied by Finland (it was the first at the previous year), Sweden as the third, Netherlands as the fourth, Norway as the 5th, Switzerland as the 6th, United States as the 7th, United Kingdom as the 8th, Luxembourg as the 9th and Japan occupying the tenth position.

Among other aspects, this study showed that, considering the economies covered, there is almost a perfect correlation (R^2 = 0,86) between the individual usage of ICTs and the Gross National Income (GNI) per capita. The individual usage of ICTs may be considered as an assessment of the conventional digital, as it is a sub-index that includes aspects as the number of mobile phone subscriptions per 100 inhabitants, the percentage of individuals using the Internet or percentage of households with computer. The economic impacts, the 9th pillar of the NRI index are also highly correlated with income per capita (R^2 = 0,65). This pillar may be considered as an assessment of the

new digital, as it is a sub-index that includes aspects as the impact of ICTs on new services and products, the ICT patent applications per million inhabitants or the percentage workforce employed in knowledge-intensive activities. One of the best examples of a large, advanced economy that makes right investments to fully leverage ICTs is the United States, remaining in 7th position of the NRI, with a strong performance in most dimensions of this index (WEF & INSEAD, 2015).

According to Bruno Lanvin, the INSEAD executive director for Global Indices, Thierry Geiger, a senior economist for global competitiveness and risks of the World Economic Forum and Soumitra Dutta, dean and professor of management at the Samuel Curtis Johnson Graduate School of Management at Cornell University (New York), the ICT, if boosted correctly, can improve economies and foster entrepreneurship and the wealth creation, through increasing productivity gains, reducing information costs, allowing new models of collaboration or changing the way people work (WEF & INSEAD, 2015).

So, over the past few decades, information technologies (IT) have radically transformed the way individuals communicate and live. In particular, organizations have been learning to discover and explore the potentials that technologies offer to improve capabilities of their employees or their processes, like those concerning the relationships with their customers, suppliers or other stakeholders.

However, this organizational performance improvement, based on the information technologies possibilities, much more than being just a technology issue, is influenced by other dimensions that are decisive in its full use of its possibilities. As Orlikowski advocated some decades ago, it is important to analyze three distinguished components and their reciprocal interactions: people, organization, and technology (Orlikowski, 1992). The Orlikowski´s Model of Technology identified four different influences among these components: a) technology as a creation of human action, b) technology as an instrument of human action, c) organizational conditions of interaction with technology and d) institutional consequences of interaction with technology. Nowadays, with the amazing possibilities of the current information technologies, the Orlikowski vision still remains even more pertinent. Although the technology is important, people and organizational issues are crucial and must be carefully addressed so that it is possible to make the information technology efficient, and thus, help to improve organizational performance.

1.2 Problem and motivation for research

As Bill Gates, the founder of Microsoft Corporation, said, “the first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency” and “the second is that automation applied to an inefficient operation will magnify the inefficiency” (Gates, 2016). Indeed, although the information technologies (IT) are key vectors of economic and social transformation, having a tremendous impact on companies’ productivity gains, companies still need to decide and agree on the IT strategies that better support and ensure their value chain and innovativeness. Otherwise, as Bill Gates warned, the adoption of the information technology simply risks magnifying all the drawbacks of existing practices without enhancing the level of organizational productivity.

A recent survey made by KPMG showed that chief executive officers (CEO) from many of the world's largest companies are strongly concerned with the fact that their companies can survive amid the incredible technology-driven disruption and by keeping their products and services relevant to their customers, which are becoming increasingly less predictable. For instance, 72% of the chief executives (of a total of 1276 CEOs) said they are concerned about keeping current with new technologies and 66% are apprehensive with their company's relevance of its products/services (KPMG, 2015). On one hand, they are concerned with the quality of the offer of their business to their customers, but, on the other hand, they are worried with technology innovation and leadership. In fact, CEOs are aware that the new technologies are redefining value chains and companies need to remain aware to stay relevant. Nowadays, modern businesses need to articulate business needs with innovative information technologies. Ensuring a good interdependence and interrelationship on these two areas is the basis of the objective of aligning the business and the information technology.

Business and Information Technology Alignment (BIA), hereafter referred to as alignment, remains one of the most important issues among Information Systems (IS) and Information Technology (IT) managers (Belfo, 2013; Belfo & Sousa, 2012). Over the past years, IT managers have been concerned with Business and IT Alignment (BIA) under the expectation that achieving alignment could positively influence business performance (Bergeron, Raymond, & Rivard, 2004; Chan, Huff, Barclay, & Copeland, 1997; Chan, Sabherwal, & Thatcher, 2006; Cragg, King, & Hussin, 2002; Croteau & Bergeron, 2001; Denford, 2009; Gerow, 2011; Kearns & Lederer, 2003; Sang M Lee, Kim, Paulson, & Park, 2008; Luftman, Ben-Zvi, Dwivedi, & Rigoni, 2010; Nash, 2006; Palmer & Markus, 2000; Sabherwal & Chan, 2001; Teo & King, 1996). Effectively, the alignment is one of the most important areas of IT governance, considered in some of the most important frameworks, like the Control Objectives for Information and related Technology (COBIT) (ITGI, 2007), the Information and Technology Infrastructure Library (ITIL) (Taylor, 2007) or The Open Group Architecture Framework (TOGAF) (Group, 2009).

The Society for Information Management (SIM) and a few different academics conduct an annual survey of the key issues facing IT executives in the United States since 1980. Since then, the top 10 management concerns have remained relatively constant. Among these concerns, the alignment of business and IT has maintained a solid position on the podium for many years. This regular survey to most senior IT leaders in hundreds of organizations based in the United States has ranked the alignment always in the top three concerns in the last decade. The last three years (2013-2015) revealed that alignment recovered and maintained the status as the first top concern (Kappelman, McLean, Johnson, & Torres, 2016; Kappelman, McLean, Johnson, & Gerhart, 2014; Kappelman, McLean, Luftman, & Johnson, 2013; Luftman & Ben-Zvi, 2010b, 2011). Another recent study about European key IT and management issues and trends for 2014, sponsored not only by SIM, but also by the biggest community of IT executives worldwide with over 5500 CIOs (the CIONET), confirmed this tendency. Indeed, this survey also ranked the IT and business alignment as the first concern among top IT managers in Europe for 2014 (Luftman & Derksen, 2014).

Gartner also conducted an important annual survey that confirmed the Business-IT alignment as one of most significant barriers to CIO success. In the 2016 survey, 11% of 2,944 senior IT leaders

across 84 countries mentioned the alignment as their main barrier to succeed as CIOs (Gartner, 2015).

But, why is that alignment consistently ranked as one of the most worrying issues among IT managers? On one hand, it seems that it really contributes to business performance and on the other hand, actually, alignment appears to have been not conveniently answered by current used approaches.

The dynamic nature of the strategic alignment and its complexity strongly influence its pursuance. Some authors report that even a sustainable "perfect alignment" is a concept simply unrealistic, given the speed and magnitude of change in business environment and technology (Pinsonneault & Oh, 2007). The phenomenon tends to be simplified by certain simplistic visions with a deterministic logic of a simple cause / effect, based on a short-term view, unlike a vision of sustainable long-term alignment, based on a co-evolutive principle (Benbya & McKelvey, 2006). No activity alone will enable the achievement and maintenance of alignment, because there are simple too many variables and business and technology environments are too dynamic (Luftman, 2003).

Based on the apparent ongoing concern with the alignment in the last decade, it is reasonable to think there has not been sufficient progress in addressing this issue. Or, at least, more efforts should be directed towards improving the alignment in order to lower the priority of this issue. Apparently, new approaches to the alignment should be essayed. There are some insights coming from other different concerns of IT managers which may help organizations to draw new strategies to get a better alignment.

Alignment is made by people. But, are personnel issues sufficiently cared? Pre-recession surveys consistently show that the concern about human resources (HR) was highly ranked (Luftman, Kempaiah, & Rigoni, 2009). After 2009, HR concerns did not appear in the top 10 list (Luftman & Ben-Zvi, 2010a, 2010b, 2011; Luftman & Derksen, 2012). The last four surveys (2009 to 2012) confirmed that the current economic conditions have apparently lowered the priority of human resources (e.g., hiring, retaining, motivating). The 2012 survey ranked the HR considerations of IT at 16th place, similar to 2011 (17th), down from 13th in 2010. However, although the last surveys showed lower priorities to human resources (HR) concerns, the survey series coming from the distant year of 1980 demonstrated a regular presence of HR issues. Furthermore, according to the IT trends study of 2015 conducted by the Society for Information Management (SIM), although the percentage allocated to employees on the global IT budget has tendentiously decreased on the last years (from 43,0% on 2009 to 37,8% of the total spendings on 2015), it still represents a very significant share of the IT expenses (Kappelman et al., 2016).

Typical concerns about IT HR are the attraction of new IT professionals and the retaining of those professionals. The SIM survey of 2008 (Luftman et al., 2009) ordered these two concerns as being the fourth and eighth most important concerns for the IT management in 2008. The success of the followed approach to either of these two aspects is closely dependent on the definition of policy incentives to staff. The attraction or retainment of IT professionals is influenced by the incentives that each organization offers to each employee. These two concerns need a definition of certain specific incentives. The analysis of the current incentive package and of other alternative or complementary

incentives may represent an important management activity in solving these two important concerns for IT managers.

Previous studies addressed the influence that specific incentives given to certain professionals have on their behaviour and therefore, in their activity and productivity. Although all professionals are important, the researchers focus their attention on top-management incentives. Among those, one of the most studied managers regarding incentives is logically the head of an organization, typically known as the Chief Executive Officer (CEO). CEO has been the centre of numerous studies (Baker & Hall, 1998; Bergstresser & Philippon, 2006; John E Core, Holthausen, & Larcker, 1999; John Core & Guay, 1999; John Core, Guay, & Larcker, 2003; Edmans, Gabaix, & Landier, 2009; Fahlenbrach & Stulz, 2011; Jensen & Murphy, 1990; Morse, Nanda, & Seru, 2011; Murphy & Jensen, 1998; Vithayathil, 2011). The behaviour effects of certain incentives on other managers, such as, chief financial officer (Gore, Matsunaga, & Eric Yeung, 2011) or store managers (DeHoratius & Raman, 2007) or on other kind of professionals or specific activities, such as, salesforce effort (Joseph & Thevaranjan, 1998), or, for instance, on health professionals and health workers (Orvill & Hicks, 2000) have also been explored.

However, what type of evidences is there about the relation between rewards and behaviour? Usually, it is difficult to measure people behaviour on organizations. It is usually easier and more usefull to measure the indirect consequences of people's actions, than to measure the actual actions. In what refers to firms, the usual indirect consequence of manager's behaviour is the firm performance. So, the usual question is about the relation between rewards and the firm performance. Good (or bad) actions by the CEO affect the entire firm, so, it can be said that the top-executives actions have a "chain-letter like" effect on the value of the firm (Baker & Hall, 1998).

In addition, there are several kinds of rewards. Rewards that are considered very popular are the cash compensation, bonus or stock´s ownership. Although there is a long list of promising rewards, those are probably the most studied kinds of rewards, especially concerning to top managers. So, what type of evidences are there about the relation between managers rewards like cash compensation, bonus or stock´s ownership and firm performance? Several studies addressed that relation.

Two highly discussed measures of CEO incentives are "the value of CEO equity stakes" coming from their percentage ownership and "the dollar change in CEO wealth per dollar change in firm value" (cash compensation and bonus), usually known as the pay sensitivity (Baker & Hall, 1998). Although those ratios are different among firms of different sizes (the percentage ownership declines dramatically with firm size and CEO dollar stakes increase dramatically with firm size), they seem to support that these kind of incentives contribute to influence top-manager´s behaviour and, doing it, affecting firm performance.

Besides the use of financial performance measures to support incentives plans, other measures of non-financial type are increasingly being used. Typical examples of non-financial measures are product quality, customer satisfaction and market share. Also, there are some evidence that nonfinancial measures are better predictors of long term financial performance than current financial measures (Banker, Potter, & Srinivasan, 2000).

Like the CEOs, it is expectable that the behaviour of other managers or professionals can be influenced by certain incentives. This work intends to investigate if the behaviour of the appropriate professionals can be changed in order to promote a better alignment. Independently of other affecting factors, this work wants to explore the importance of behaviour aspects within IT practitioners' activity, so it reviews three important theories and relate them within this context. The first one is the agency theory that explores the problem of principal (usually an employer) and agent (consequently an employee) divergences (Eisenhardt, 1989). Second, the Alderfer theory (Alderfer, 1969), known as "Existence, Relatedness and Growth" (ERG) which is a model based on three types of human needs and third, the expectancy theory (Isaac, Zerbe, & Pitt, 2001) that relates the level of motivation with the attractiveness of the rewards sought and the probability of obtaining those rewards.

Strategic alignment typically involves the communication of the high-level strategic objectives by the business managers to all employees in a way that everyone can understand, trying to create intrinsic motivation and inspiration to all so that each one help the organization's success (Kaplan & Norton, 2004). Then, it is usually used extrinsic motivation, by setting targets at various levels, from personal to global. According to Kaplan & Norton (1996), strategy, materialized in the form of a balanced scored card, is a tool which to be used up and down the organization, becoming available to everyone. As the high-level scorecard cascades down, it is possible to tie strategic objectives to group objectives and then an individual performance and compensation system with "personal scorecards" (Kaplan & Norton, 1996b). These objectives should be aligned with the organizational strategy and associated to incentives / rewards to employees when objectives are achieved; either they are personal or departmental, business unit or enterprise objectives. This work assumes that the alignment should exist between individual interests and organizational objectives, proposing a model to better align the business and IT taking into account an incentive policy. The introduction of a total incentive policy encourages not only the work efficiency of each employee, their satisfaction and performance, but also the psychological and organizational behaviour (WorldatWork, 2008). The definition of a global incentive's strategy allows alignment of organization strategy with the individual strategy, including all aspects valued by employees in their working relationships as payment, benefits, career and work environment.

For almost two dozen years, Fortune, the well-known American business magazine, lists the best one hundred companies to work for. The list of year 2015 marks Fortune's 18th year of partnering with Great Place to Work and ranks Google as number 1 for the sixth time (Fortune, 2015). One pertinent question would be to know if, being one of the best companies to work for, implies a better performance. The partner of Fortune in this initiative, the Great Place to Work, a global human resources consulting, research and training firm, specialized in organizational trust, published a study showing that the "Fortune 100 best companies to work for" consistently outperform major stock indices, like Russell 3000 and S&P 500, by a factor of nearly two. The Fortune's list of 100 best companies to work had an average stock market return of 11,07% between years 1997 and 2014, contrasting with the Russell 3000 and S&P 500 indexes which had a return of 6,76% and 6,48%, respectively (see Figure 1).

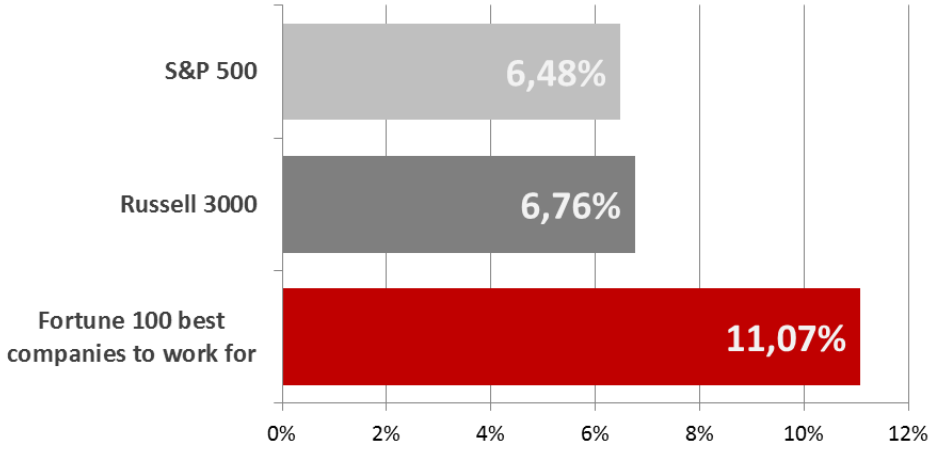


Figure 1: Comparative annualized stock market returns from 1997 to 2014
Source: Adapted from Great Places to Work (2015)

This study also seems to confirm that when times are tough (1999 to 2002 or 2006 to 2008), employees at great workplaces show the resiliency to pull through, and when times get better, the same employees appear to lead the rally. Another interesting finding of this analysis is that "best companies to work for" normally have 65% less voluntary employee turnover (the proportion of employees who leave an organization on a year-on-year basis) comparatively to their competitors (Great Places to Work, 2015). This better behaviour not only saves money and time in employee recruitment and training, but also improves team dynamics, productivity, and the continuity of service to clients and other employees.

Indeed, companies considered best places to work have proven to be resilient in times of crisis, as neither their financial performance, nor their systematic risk are affected during more difficult periods. There are usally two rationales to explain why a best employer award should impact a firm's financial performance. The first reason is that when an independent institution recognizes a company as having a great workplace, it sends a powerful message to the market about the company's ability to deliver superior performance. The second reason concerns the intrinsic value of having superior employee relations. Due to the superior way in which companies with great employment relationships manage their employees, they are therefore likely to achieve better performance (Carvalho & Areal, 2015).

The alignment between business and IT is highly supported on team collaboration. Companies that have a lower employee turnover, with key persons remaining longer on the company, are in a better position to better achieve strategic and operational alignment objectives, guaranteeing that the alignment processes become more mature with time. Also, the lower the number of employees leaving an organization, the higher is the probability of improving team competences to implement a more mature technology and assure a continuity and improvement of the IT service to business (either to clients or to other employees). Consequently, it is acceptable to think that a better place to work for also creates the conditions to have a better alignment between business and IT.

1.3 Definition of most important terms

Regardless of using lot of different terms, this thesis uses particularly some that are considered central to the studied subject. Although better addressed later on, this section presents a brief introduction to the most important used terms, such as business and corporate strategy, IS/IT strategy or business and information technology alignment.

(a) Business and corporate strategy

According to Porter (1996), business unit strategy may be defined as the concern how to create competitive advantage in each of the businesses in which a company competes. Porter also supports that in a corporate environment there is added value in the development of the interrelationships between all the businesses units and their strategies. He supports an adequate definition of a corporate strategy which defines what businesses the corporation should be in and how the corporate office should manage the collection of business units.

(b) Information system/Information technology strategy

Strategic Information System Planning (SISP) is usually associated with the development of a strategy that uses the IS/IT to achieve innovative competitive advantages. The SISP involves a proactive search for competitive advantage and value creation (Grover & Segars, 2005). Certain "frameworks" such as Critical Success Factors and the Value Chain, appeared to improve the SISP. Authors such as Grover and Segars (Grover & Segars, 2005) argue that there are three steps in SISP. A first step which involves the top management of the SISP, with limited information and so without setting concrete plans, but only the overall objectives. A second stage where the planning process begins to involve the IS and a third and final stage where it is wanted the integration of plans and involvement in both directions between organizational management and management of IS. Other authors argue that SISP process helps identify strategies for IS and IT projects from the requirements of each business unit, linking strategic and operational level (Peak, Guynes, & Kroon, 2005).

(c) Business and information technology alignment

The alignment concept has been used in several fields, namely in strategic management, referring first to the need to consider external factors in the definition of the strategy that will enable the company to adapt to the structure of the industry. Secondly, alignment should consider the organization's strategy fitness with an internal appraisal of the firm, configuring strategies, objectives, action plans, and decisions throughout the various levels of the organization (vertical alignment) or through a cross-functional integration, connoting the consistency of decisions across functions like marketing, operations, human resources (HR), complementing and supporting each other (Kathuria, Joshi, & Porth, 2007; Porter, 1979; Prieto & Carvalho, 2011; Siggelkow, 2001).

Like in other areas, the subject of alignment has also been a central concern in the information systems field. The phenomenon of business and IT alignment has been addressed by the literature using different terms. Some authors used the word "fit" (Venkatraman, 1989), others used "linkage" (Reich & Benbasat, 1996) or "fusion" (Evans, 2004) to designate it. Other authors use expressions such as "strategic alignment" (Chan et al., 2006; Henderson & Venkatraman, 1993), "strategic fit" or

"functional integration" (Henderson & Venkatraman, 1993). "IS alignment" (Benbya & McKelvey, 2006), "IT alignment" (Chan & Reich, 2007; Henderson & Venkatraman, 1993). Regardless the name that is used, the idea of the alignment is normally associated with the "measure of how much the mission, objectives and plans of IT support and are supported by the mission, objectives and business plans" (Reich & Benbasat, 1996).

Furthermore, some authors emphasize the dynamics of the concept, arguing that the strategic alignment is partly a process of development of cooperation between professional groups related to business and IT (Campbell, 2007), while others claim that when an organization is aligned then their employees will have a common purpose, shared vision and an understanding of how their personal role may help global strategy (Kaplan & Norton, 2004). Moreover, other authors studied specific types of alignment as the social alignment or the technical alignment (Sang M Lee et al., 2008; Reich & Benbasat, 2000). The issue has been generically associated with expressions (and their acronyms), such as "Business & IT Alignment" (BIA) (Silvius, 2007), "Strategic Alignment of Information Technologies (SAIT) (Pinsonneault & Oh, 2007) or "Strategic Business and IT Alignment" (SBIAT) (Prado, 2009).

(d) Motivation

According to the Encyclopedia Britannica, motivation may be defined as the "forces acting either on or within a person to initiate behaviour". The activating properties of the processes involved in psychological motivation give meaning to the origin of its Latin term: motivus (“a moving cause”) (Petri & Cofer, 2013).

Motivation is related with activation and intention. It concerns energy, direction, persistence and equifinality. Its importance in the real world is based on its tangible consequences. Ryan and Deci (2000b) clearly underlined that importance when they said that “motivation produces”. Motivation is a central concern of the society – to know how to move ourselves or others to act. “Parents, teachers, coaches, and managers struggle with how to motivate those that they mentor, and individuals struggle to find energy, mobilize effort and persist at the tasks of life and work” (Deci & Ryan, 2011).

(e) Reward

Reward can be defined as something given or received in recompense for worthy behaviour or in retribution for evil acts (Reward, 2009). From the point of view of an organization, the reward is the compensation that an employee receives from such organization for his or her service (Jiang, Xiao, Qi, & Xiao, 2009).

Rewards systems, or appraisal systems as it can also be called, are important for any companies. A reward system may be defined as a structured method of evaluating and compensating employees based on their performance (Holmes, Carvalho, & Powers, 2010).

(f) Incentive

An incentive is any form of variable payment, generally non-discretionary, linked to the employee performance. It can be tangible or intangible, may or may not have cash value, can be paid at any time of the year and includes awards, rewards and recognition (Intelispend, 2013).

An incentive is "something, such as the fear of punishment or the expectation of reward, that induces action or motivates effort" (Incentive, 2009). An incentive (or an inducement) is usually designed in order to encourage a specific behaviour, so, it should be something valued by an individual or group that is offered in exchange for an increased performance (IFI, 2010). In business, an incentive is typically operationalized with a specific stimulus, for instance, an additional payment made to employees as a means of increasing production. The proximity of the incentive concept to the kind of reward associated with it justifies the designation usage of incentive system (Gallini & Scotchmer, 2002; Porter, 1996; Stolovitch, Clark, & Condly, 2002) or reward system (Holmes et al., 2010; Igbaria, Greenhaus, & Parasuraman, 1991; Jiang et al., 2009) almost indistinguishably.

If, instead of stimulating a positive response, the objective of the object is encouraging and stimulating avoidant behaviours, it is known as a negative incentive (Psychology Dictionary, 2013). Some examples of negative incentives are demotion, transfer, fines or penalties.

(g) Incentive system or program

According to the Incentive Federation, an alliance of associations involved in various aspects of the incentive field, “an incentive system is an organized program of business rules culminating in individual awards and/or recognition offered for the purpose of motivating employees”. The incentive programs or systems should promote or encourage specific actions, be designed for a specific audience, produce measurable outcomes and should take into consideration integrated motivational strategies (IFI, 2010).

There are different types of incentive programs. Among others, the most important are the "quota-based" (incentives are given for meeting or exceeding a performance goal), the "piece-rate" (for increasing rates of performance - doing more of something), the "tournament" programs (where individuals and/or teams compete with each other for incentives) or the "fixed-rate" incentives (salary-based compensation, typically associated with a scheme that pays predetermined amounts of money per unit produced) (Stolovitch et al., 2002).

(h) Moral hazard

Paul Krugman, the Nobel awarded economist, defined moral hazard as “any situation in which one person makes the decision about how much risk to take, while someone else bears the cost if things go badly” (Krugman, 2009). One of the classic examples is associated with insurance premiums, where the person taking out an insurance policy has advantage in opposition to the insurer. Because of that, the insurer charges a premium for the risk derived from their imperfect information (Policonomics, 2013).

The moral hazard situation also occurs in a principal-agent problem, based on the relation of two parties, one, called an agent acting on behalf of another party, called the principal.

(i) Information asymmetry

If one party in a transaction has information that the other part does not have, then the traditional economic view assumes there is information asymmetry. Consequently, the outcome of the transaction is affected or behaviours are induced by those who have the private information. Such information asymmetry leads to moral hazard and adverse selection (Vithayathil, 2011).

In the field of IT, Vithayathil (2011) sustained that the environment which allows a rapid technological progress depends on mechanisms by which knowledge can be transferred between the CIO and the CEO. This environment is characterized by information coming from factors like cost reduction, capability increase, new services, market changes, new products, new capabilities, new functions, obsolescence, competition and new strategies. Yet, the existing information asymmetry between the CIO and the CEO is mainly due to the fact that, on one hand, IT knows the new technology developments, but Business may not foresee those benefits. On the other hand, the IT may not know business issues sufficiently to leverage new technology.

1.4 Background of the problem

Several researches addressed the study of the factors that influenced the IT and Business alignment. In a study made by Chan, Sabherwal and Thatcher (2006) about the previous factors of alignment, it was analyzed the importance of the sharing of domain knowledge, the sophistication of the planning of IT and the credibility of the planning of the IT group, a consequence from past successes. Among the various hypotheses tested and validated, the strongest relationship founded was the relationship of factors directly related to the management of IT, particularly the relation between the sophistication of the planning with the shared knowledge. The second strongest relationship found by this research was the relation from the shared knowledge to the level of alignment achieved. This study evidenced that the influence of the credibility of IS group, derived from past successes, also influences the degree of alignment and shows that alignment influences organization performance (Chan et al., 2006).

As can be seen in Figure 2, the influence of the credibility of the IS group, derived from past successes, also influences the degree of alignment and shows that the latter influences the performance of the organization (Chan et al., 2006). Figure 2 also illustrates the various relationships, empirically demonstrated, using arrows with stronger colors and thicker lines for stronger relationships and gray dashed for unproven relations.

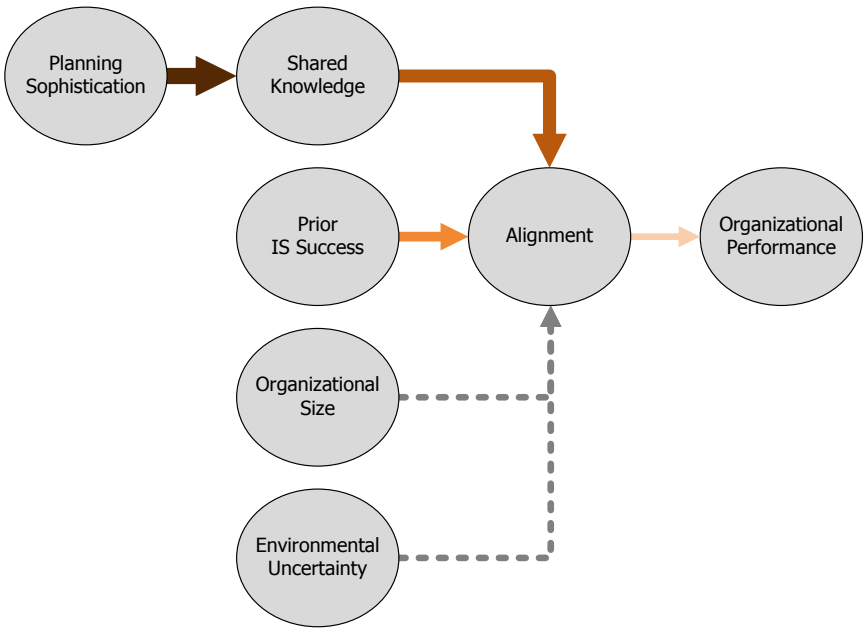


Figure 2: Antecedents and outcomes of strategic IS alignment
Source: Adapted from Chan et al. (2006)

This same work also shows the effects of different business strategies in alignment. Considering three types of business strategies (defenders, prospectors and analyzers), the prospector strategy is the one where it is more difficult to achieve alignment. Chan et al. (2006) reveal that the defender strategy is one that ensures better alignment in the case of credibility of the group of IS derived from past successes.

The most common indicator used to measure the degree of explanation of a model is the proportion of the total variation of the explained variable, known as the coefficient of determination, denoted R^2. The model proposed by Chan, Sabherwal and Thatcher (2006) explains 10% of total variation of alignment for business firms (the significant factors were the shared domain knowledge, the prior IS success and the organizational size) and explains 19% of total variation of alignment for academic institutions (the significant factors were the shared domain knowledge, the prior IS success and the environmental uncertainty). In what refers to business strategies, it seems that this model and its factors better explain the alignment at business firms that have a defender strategy with a R squared of 0.22. The model explains 12,8% of alignment in firms with a prospector strategy and 8,2% in firms with an analyzer strategy (Chan et al., 2006).

Partially, these results confirmed the outcome obtained in previous studies by other authors. The work of Reich and Benbasat (Reich & Benbasat, 2000) intended to study the influence of four factors in the alignment of short-term (for the mutual understanding between business and IT managers) and the alignment of long-term (on the IT vision congruent between these same managers from both sides). This study investigated the influence of some factors on the alignment, based on 45 informants from ten business units of the Canadian life insurance industry. It differentiated the degree of mutual understanding of current objectives (calling it short-term alignment) and the congruence of the IT vision between business and IT executives (as long-term alignment). It showed that the sharing of domain knowledge, the success of IT implementations, communication between business and IT managers and links between business and IT planning influences the short-term alignment. For the alignment of

long term, only the sharing of domain knowledge also showed that influence (Reich & Benbasat, 2000).

Moreover, the work of Campbell (2007) also indicates that the decision making of managers, when confronted with a particular challenge, is dependent on the knowledge they have, but also the authority they have to decide, and that these two factors influence the alignment. Nevertheless, this work stresses the dependence of the alignment of not only one individual variable or small groups of variable, but of the interaction between variables and so, the importance of seeing the alignment as a dynamic process. A CIO, one of the participants of the focus group used on this study, stressed that there are other factors, like incentives or measurement schemes, which influence managers when attempting to implement strategies. He said:

> *"... one example that really stands out in my mind was very much a case of managing the perceived bottom line in order to shore up bonuses. It was as blunt as that. Things that should have been done to ensure the long term growth assets of the company were being pushed back because of "if I don't make this number this quarter I don't get my cheque".*

In summary, those previous studies showed some important factors that influence alignment. Yet, they recognized the complexity of the alignment phenomenon and that alignment does not depend just from those studied factors. For instance, the model from Chan, Sabherwal and Thatcher (2006) explained less than 20% of the alignment phenomenon. Other factors seem to be needed to explain the alignment.

According to Vroom (1964), people consciously choose to develop specific actions based on their perceptions, attitudes and beliefs, as a consequence of their desires to enhance pleasure and avoid pain (Isaac et al., 2001). Once a more mature alignment depends on specific actions and attitudes, organizations must specify policies to guide efforts in the workplace.

The reward´s model proposed by WorldatWork (2008) supports that an incentive strategy definition should have a broad view about incentives, contemplating the main areas of rewards. The proposed model has five elements which are compensation, benefits, work-life, performance and recognition, development and career opportunities. This generic reward approach may also be used to design incentives of CIOs and other IT staff. Nevertheless, there are specificities among those professionals that should be considered for those incentives. Because the creation of value by IT is achieved through good integration of enterprise architecture, business architecture, process design, organization design, and performance metrics, it is expectable that CIOs activity, unlike the CEOs or chief financial officers (CFO), may not effectively be reflected by financial performance measures (Banker, Feng, & Pavlou, 2013). Coherently, an incentive policy of the IT staff should be designed accordingly. One question arises: what should be considered in an IT incentive policy, balancing elements like compensation, benefits, work-life, performance and recognition, development and career opportunities? That will depend on the generic goals defined for the IT department. One of these goals can be the alignment of business with IT. If so, incentives should be planned in a way that enhances it.

Some of the previous studies evidenced a positive influence on the alignment by some factors that may have a behavioural nature of the alignment promoters at organizations. For instance, factors like the sharing of domain knowledge or the credibility of the IT group (Chan et al., 2006) and even the more global concept of social alignment, mainly referring to the understanding and commitment of specifically, the business and IT executives, with the business and IT mission, objectives, and plans (Chan & Reich, 2007; Reich & Benbasat, 2000) are specially focused on people involved in promoting the alignment and may be related to some types of incentives that managers need to pursue the alignment. Another most recent research, supported on the principles of the balanced scorecard (Kaplan & Norton, 1996b), and based on the conventional interpretation of relations or possible conflicts of managers (agents) with the shareholder (principal), given by the theoretical lens of the agency theory (Eisenhardt, 1989), proposed studying the influence of effectives incentive plans on the conceptual alignment (shared vision) and on the alignment of actions (Johnson, 2014). Moreover, the innovative conceptual model behind the study of Johnson (2014) succeeded in supporting the hypothesis that alignment is influenced positively by an effective incentive plan.

Indeed, although previous researches may have supported that some behavioural factors could influence the alignment; the model of Johnson (2014) seems to be possibly the first that explicitly proposed the alignment being influenced by an incentive plan, a similar idea to the main model behind this thesis. Yet, despite the model of Johnson (2014) has proposed and supported that incentive plan influences the alignment, its perspective of the incentive plan and of the alignment was limited and did not assumed that these two constructs could be addressed as more complex constructs, much better modeled if considered higher order variables. Despite the fact that the model proposed at this thesis is focused in exploring the relation of incentive with the alignment, however, it sees the incentive and the alignment with a more holistic perspective and as constructs much more complex. Consequently, the proposed model considers these two constructs as latent variables of second order, anchored on a set of latent variables of first order that, only then, relate directly to observable indicators.

The research of this thesis is supported on the conviction that alignment between business and IT is a major concern among managers and that other approaches should be essayed in order to light new ways to improve that alignment. The starting point to this research is the principle that motivational factors are expected to affect individual behaviour of business and IT managers in order to improve alignment.

1.5 Statement of the problem

The alignment is an important concern of most important IT frameworks to be considered for IT governance, like the COBIT (ITGI, 2007), the ITIL (Taylor, 2007) or TOGAF (Group, 2009). Furthermore, during a long number of years now, the alignment remains regularly one of the most important concerns among IT managers (Kappelman et al., 2016; Kappelman et al., 2014; Kappelman et al., 2013; Luftman & Ben-Zvi, 2010b, 2011; Luftman & Derksen, 2012). This concern, consistently expressed, is probably related to the belief that the alignment supports organizational performance.

The above mentioned research of Chan, Sabherwal and Thatcher (2006) studied and supported the impact of the alignment on the organizational performance (see Figure 2). At that model, alignment

was the responsible for the explanation of part of total performance variation of business firms and academic institutions, with 4% and 16% of such variation, respectively (Chan et al., 2006).

Although the organizational performance depends on a complex set of factors, it seems that the alignment between business and IT helps IT investments to have a higher payoff and for that reason, organization having a higher performance. Even if the phenomenon is not consensual, still raising some doubts (Palmer & Markus, 2000; Sabherwal & Chan, 2001) and cannot be characterized by a simple linear relationship (Tallon & Kraemer, 2003), therefore still needing more research. Several studies have consistently supported the fact that companies with greater alignment are better performing companies (Almajali & Dahalin, 2011a; Bergeron et al., 2004; Byrd, Lewis, & Bryan, 2006; Chan et al., 1997; Cragg et al., 2002; Croteau & Bergeron, 2001; Papp, 1999; Teo & King, 1996).

On the other hand, the importance of studying new ways to improve the alignment is not just limited to the importance of its direct influence on organizational performance. Other perspectives of some researchers emphasize the influence of the alignment on the competitive advantage of the organization (Almajali & Dahalin, 2011a, 2011b; Kearns & Lederer, 2000, 2003; Sethi & King, 1994). Instead of studying the direct effect of alignment on organizational performance, the alternative idea is the investigation of the effect of alignment on the organizational factors that enable a firm to outperform its competitors, either through cost leadership or through differentiation, according to Porter´s approach of competitive advantage (Porter, 1985). Later, and as expected, the competitive advantage factors will contribute to a superior organizational performance (Fahy, 2000; Majeed, 2011).

The fact that alignment is recurrently among the central concerns among IT managers and the assumption that it, directly or indirectly, promotes the organizational performance feeds the main motivation of this research: a contribution to the improvement of the alignment between the business and the Information Technology. Assuming that a higher alignment implies a better organizational performance, it seems that pursuing a better alignment should be an important objective among team members from business and IT.

Of course, the general alignment is possible to be achieved by the management of the IT through an agreement with the business partners about certain organizational objectives. Then, an aligned strategy should be approved either at IT side or business side, supporting the achievement of those negotiated objectives. Consequently, at the IT side, its strategy is materialized through the selection of some specific IT projects. The high level perspective, involving the definition of the IT strategy, allows an operational level perspective, which facilitates the evaluation of the benefits and impact of each IT project on the organization. By assessing the proposed IT projects, some can be selected and so, contributing to the global alignment (Mirani & Lederer, 1998).

Indeed, it is interesting to see this problem as a different levels approach: a strategic business-IT alignment and a tactical alignment. The higher level, the strategic business-IT alignment, includes processes like linking business planning and IT planning, the exploiting of IT-based strategic opportunities and the proactive influencing of the CIO in strategic planning. A lower level, the tactical alignment, mainly embraces the alignment at the level of projects but also the aligning of decision-making processes of the IT function and other departments, the balancing at firm-wide technology standardization, the formal and informal IT-business communication and the alignment at the level of

IT skills (Tarafdar & Qrunfleh, 2009). The conscientious that the alignment enhancement should consider the orchestration of internal and external processes at different levels of the organization is still not widespread. Most alignment approaches are essentially dedicated at the strategic level and give little attention to lower levels of the organizations, namely the tactical level and even the operational level, also recognized as important areas to achieve alignment (Gutierrez & Serrano, 2008).

Practice seems to show that IT projects are not usually selected according to their benefits realization, overvaluing their technological side (Ashurst, Doherty, & Peppard, 2008). Although an analysis at the project level is important, a global approach should be essayed, allowing not only the selection of one project at each moment, but seeing the global picture and promoting a better evaluation and selection of IT projects based on a global perspective, properly weighing the major concerns of the business. The pursuit of an objective like the improvement of the alignment between the business and IT gives that necessary “big picture” perspective, which is difficultly achievable if only looking at the project level.

Nevertheless, why is alignment consistently named as one of the most important concerns in the last decade (Kappelman et al., 2016)? The fact that this topic is consistently referred as one of the most important concerns reveals its importance. Yet, it also reveals another thing. Apparently, it seems that majority of used approaches haven´t changed significatively this status quo. The main motivation of this research is to contribute to better understand some aspects that influence the alignment between the business and the IT. By better understanding the alignment, it will be probably easier the accomplishment of a higher alignment, and consequently, the promotion of the use and improvement of a "big picture" perspective involving both business and IT.

The firm is frequently treated as a black box. By doing it, "the theory remains silent on how the owners of firms succeed in aligning the objectives of its various members like workers, supervisors, managers with profit maximization". When the firm is deeply studied, incentives become the central focus of this analysis (Laffont & Martimort, 2001). And if incentives given to employees may be so important to help to achieve the firm´s objectives, why not try to use them to positively influence the alignment?

The incentives programs seem to be effective to attain organizational purposes. For instance, incentives improve performance by an average of 22%, team incentives can improve performance by 44% or, performance is improved by 26% when incentive programs are used to encourage “thinking smarter” (IFI, 2010; Stolovitch et al., 2002).

Also, some professions are more likely to need a special attention, like those having the characteristics of an agent. As Arrow enunciated it, “by definition the agent has been selected for his specialized knowledge and the principal can never hope to completely check the agent’s performance” (Arrow, 1968). When information about the agent is imperfect, the problem of delegating a task to him, someone who has different objectives than the one who delegates this task (the principal), becomes the main question of the incentive (Laffont & Martimort, 2001). As it will be better explained ahead, IT managers and most IT professionals, like other responsible for the promotion of the alignment, behave as agents.

1.6 Purpose and importance of the study

The Economist Intelligent Unit of the well-known newspaper "The Economist", sponsored by KPMG International, conducted a global survey, encompassing more than 1,000 C-suite executives, mainly CEOs (with 28 percent of the responses), but also considering other executives as CIOs or chief technology officers (with 7%), to explore how effectively companies are integrating a holistic governance, risk and compliance throughout the enterprise. Among the principal findings of this survey carried out in December 2012, the C-suite sees risk management as critically important but underlines that few organizations are articulating their risk appetite. In addition, another conclusion was that weak incentive structures impede risk-based decision-making (KPMG, 2013). This survey also suggested that a way to improve general alignment is to offer incentives to employees, from top to bottom, that will motivate them to consider skillfully the risk and opportunity in every business decision they make (Asher et al., 2013). In short, the study of The Economist and KPMG supported the importance of companies to define incentive policies to encourage employees' behaviours encompassing the improvement of the alignment of business with customer strategies, the alignment of business with support functions as IT, human resources, finance or legal, as well as the alignment of the boards of directors with investors. Suitable incentives make it easier to employees to leave their comfort zone, even if they have to take some extra risks.

The idea of the study behind this thesis starts with the recognition of the importance of defining incentives to promote organizational objectives. Also, it elects the alignment of business with IT as an important organizational goal to be pursued. Accordingly, the main purpose of this research is to study the impact of incentives on the alignment, and so, allowing to develop an outlook which can help to improve the alignment of the business with IT. Considering the alignment as a vital organizational objective, it searches for particular incentives schemes which may be specifically suitable for those responsible of the alignment promotion.

The fact that incentives are valued by employees is part of our common sense. Incentives play an important role at employees behaviour´s when they are performing (or not) their daily job activities. Although some people give more importance to certain things or situations that other, usually everybody define certain goals as important and so, pursue them the best they can.

However, encouraging someone to do something is a complex task. Besides other aspects, incentives must be meaningful to those whom they are intended to. What types of incentives engage employees to do the alignment? Of course that corporate values and goals should be at the centre of the attentions. Those should be understood by employees in order that they can line up their personal actions with the organization goals. Although organizations may discuss their goals at a higher decision level, it is at an individual level that things will happen. If the alignment is elected as an important organizational goal, how can we encourage employees to improve it? The objective is to help bringing the alignment from an organizational level to the personal level (Intelispend, 2012).

The importance of this study is amplified not only by the fact that alignment is a complex objective, but also because alignment is promoted by professionals with specialized knowledge, whose work is usually difficult to be controlled by others. Most of these professionals have the characteristics of an agent, as expounded by Arrow (Arrow, 1968). The agent characteristics of these employees

increase the importance of designing adequate incentives which encourage them to improve the alignment.

By giving importance to incentive policies, it is theoretically possible to drive some personal behaviour of those responsible for the promotion of the alignment of business with IT. If incentives are defined taking into account the alignment objective, then, this objective is naturally more sought by each one. Furthermore, if objectives or the nature of the work are complex, which is the case, then, a good way, even if it is in an indirectly way, to achieve this so important organizational objective, is through an incentive policy.

In doing so, the alignment objective itself, don´t need to be daily controlled. Indeed, with the adequate incentives, despite it would be almost impossible to be done, it is not so important to make a continuous control of daily activities of these professionals. Of course, this does not mean that the control is not important. Indeed, an implementation of incentives will only be completely effective if organizational objectives were defined, the personal objectives were also defined accordingly, then, both measured and lately comparing with what it was previously aimed and concluding if objectives were, or were not, achieved. Yet, the controlling activity may be done not so frequently.

For the time, it may be assumed that incentives are important to achieve such a complex organizational objective like the alignment between the business and the IT. Yet, there are too many different types of incentives. Some incentives may motivate some people more, other incentives are better to engage others more. For instance, it wouldn´t be appropriate to give an avid fisherman a certificate for a mud wrap at a spa, or reward a vegetarian with a dinner at a steakhouse. When we want to discuss incentives that promote the alignment, we should try to answer a question: are there incentives more suitable then others to promote alignment? And if so, what are those kinds of incentives? Also, assuming that there are some dependency relations between incentives and the alignment, is there any dependency of those relations with some individual or organizational factors?

Further ahead, it will be presented a framework that relates the degree of the incentives with the level of achievement of the alignment. As it will be better explained, there are different types of incentives, which can come from areas like the compensation, benefits, work-life, performance/recognition and, development and career opportunities. Likewise, alignment is not an easy concept. It is typically seen as a composition of several areas. Typical areas of the alignment are the maturity of communications, measures of competence and value, governance, partnership, technology scope and skills (Luftman, 2003).

The expected contribution to the scientific community is the proposal of a new framework about the business and IT alignment, centered in the incentive policy role on the alignment. It is also expected that this framework can be used by IT or business practitioners to enhance their organization business and IT alignment. Hopefully, this framework may help organizations improving their strategic alignment, by acting via a policy of incentives that may include one or more of the following dimensions:

- More mature communications,
- Better measures of competence and value,

- Improved IT governance,
- Advanced partnerships
- More mature technology
- More appropriate skills

After an alignment maturity assessment is done, some alignment opportunities will emerge. Then it is possible to develop an exercise to define a policy of incentives in order to obtain better specific criterion alignment, which contribute to general organizational alignment. The triggers to these possible firm improvements are those related with individual or group incentives. Those are compensation, benefits, work-life, performance/recognition and development and career opportunities (or parts of them).

1.7 Research questions

The problem, the purpose, and the importance of the study previously outlined support some research questions. There is one primary research question (PRQ) and two secondary research questions (SRQ), which are the following:

PRQ:	What is the influence of incentives in the alignment of business and IT?

First of all, this question implies the research of the direct relation between these two constructs (the incentive policy and the alignment of business with the IT). According to what was briefly presented above, it is expectable that organizations with higher incentives will have a higher alignment between business and information technology. This research wants to study that there is a relation of implication between these two constructs. Furthermore, if that direct influence is confirmed, what are the dimension and the sigh of that influence? Is it very significant?

SRQ1:	What is the relevance of each dimension of an incentive policy?

Futhermore, the incentive is a complex construct and should be composed by several dimensions. Consequently, it would be important to know not only the influence of incentive on alignment, but also the relevance of each particular dimension of the incentive. By knowing if some of these dimensions are more significant to the global incentive than others, some business practices may be implemented taking that fact into consideration.

SRQ2:	What is the relevance of each dimension of the alignment of business and IT?

The same happens with the alignment construct. The alignment is also a complex construct that is going to be composed by some dimensions and it would also be important to know the influence of each particular dimension of it. Again, if managers know that some alignment dimensions are more important than others, the strategies defined to improve the alignment may be developed accordingly.

1.8 Framework, scope and simplified conceptual model

The framework that will be used at this research comes from two areas of knowledge. The first belongs to the body of knowledge of the technology and information systems, specifically the alignment of business with the IT. The second area refers to incentives and rewards at organizations and should be analysed through the eyes of the most important behavioural theories.

As will be further explained in chapter 2, the alignment is a multifaceted concept and corresponds to a complex organizational process in order to improve it. The literature review that was done at this thesis covers the background of the alignment and some relevant alignment models. It reviews the work of Chan et al. (2006) about previous factors of alignment, the work of Reich and Benbasat (Reich & Benbasat, 2000) concerning the influence of four specific factors in the alignment of short and long-term and the work of Campbell (2007) that wanted to evidence the dynamics of strategic alignment and the importance of, not one particular variable, but the interaction of all variables.

Of course, when alignment is the topic, the work of Henderson and Venkatraman should be referenced. These authors proposed one of the most cited models about business and IT alignment (Henderson & Venkatraman, 1992, 1993). Their model´s main objective is the integration of the strategic alignment with the functional alignment. Another important alignment model is the one proposed by Peppard and Ward (2004), evidencing the importance of information systems competencies in the alignment and later in the organizational performance, and the model proposed by Benbya and McKelvey (2006), which, besides the strategic and operational levels, includes an individual level that was not explicit in previous models. More recently, Mendoza proposed the inclusion of two type of factors that influence the strategic alignment, the dynamic factors and the structural factors (Anabel Gutiérrez Mendoza, 2009). Chapter two will better present these models and approaches of alignment.

Chapter two will also review some of the most important motivational theories in order to better understand significant aspects of the incentives. It has been argued that current alignment research is largely atheoretic. The investigation about alignment is presently heavy reliable on the strategic management reference discipline and contingency theory (which some do not consider theory). It is recommended a greater use of well-established theories in the alignment research (Chan & Reich, 2007). This was one of the main motivations for the presentation of several behavioural theories which may support the proposed model of this research. Among the most important behavioural theories relating to motivation are the Maslow's need-hierarchy theory, supporting that employees have five levels of needs (Maslow, 1943), the two-factor theory, sometimes named Herzberg's motivation-hygiene theory, categorizing motivation into motivators and hygienes factors (Herzberg, 1964; Herzberg, Mausner, & Snyderman, John Wiley & Sons, Inc./1959), the Alderfer theory, known as “Existence, Relatedness and Growth” (ERG), which models three types of needs that people have, namely existence, relatedness and growth (Alderfer, 1969), the Vroom's expectancy theory model, which relates the level of motivation with the attractiveness of the rewards sought and the probability of obtaining those rewards (Isaac et al., 2001) and the Self-Determination Theory (SDT), distinguishing between different types of motivation based on the different reasons or goals that give rise to an action

(Richard Ryan & Deci, 2000a). Finally, but yet very significant in the context of this thesis, there is the agency theory. The agency theory explores the problem of the divergences between the principal (employer) and the agent (employee) (Eisenhardt, 1989).

After the review of these motivational theories, paying a special attention to the agency theory rational, the next topic covers incentives and rewards. One of the most known reward models is the one proposed by the WorldatWork, an association representing professions comprising total rewards (WorldatWork, 2008). The proposed framework has five elements which are Compensation, Benefits, Work-Life, Performance and Recognition, Development and Career Opportunities. These different areas of incentives will be used to guide this part of the literature review.

Afterwards, a specific topic about incentives which eventually better promote the alignment is presented. Here, a literature review is made about possible specificities of incentives and rewards concerning the organizational objective we intend to achieve: the alignment of business and IT.

Grounded on a set of theories that will be better explained further on, the main idea is to propose a model that "allows the reader to easily comprehend complex relations". So, based on this theoretical framework, it is proposed a research conceptual model to be develop in four steps (Carpiano & Daley, 2006):

- identify important constructs,
- detail the causal flow,
- detail causal relations by using appropriate arrows,
- indicate positive or negative relations above the causal arrows.

The problem itself, as it was enunciated, delimits the study (Long, 2004). The study explores and tests a model in order to better understand the influence of an incentive policy in the alignment of business with IT. Although there are other factors that might influence the alignment of business with IT, this study is delimited to the factors which might be considered incentives.

The universe considered at this study consists of all large or medium-sized enterprises. The target population under investigation is confined to all Portuguese large or medium-sized enterprises. There was no restriction on the economic sectors of the firms surveyed on this study.

Although the complete conceptual model is better explained and justified further on, a simplified version of this model is already presented at Figure 3. First, the abstract concepts that comprise the model are identified. This conceptual model uses two constructs, "incentive" and "business and IT alignment", drawn from the set of theories, that will be used to guide the appropriate selection of observed measures or variables.

Secondly, the detail of the causal flow is usually done from left to right, where the variables at the left side of the model are assumed to be antecedent from the variables at the right side. Here, it is assumed that "incentive" is a causal antecedent of the "alignment".

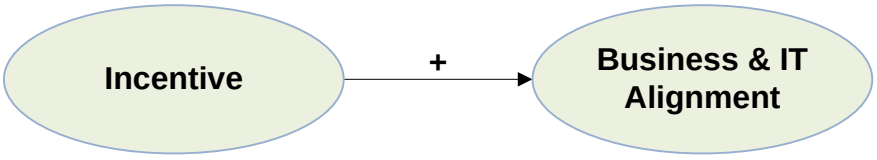


Figure 3: Simplified research conceptual model

Thirdly, the usage of arrows to detail causal relations is done through a single headed arrow that shows that one variable implies the other. And fourth, depending on the complexity of relations being tested, the direction of hypothesized causal relation it is usually showed by placing a "+" or a "-" sign above the causal arrow to respectively indicate the type of relation between the two variables. This conceptual model hypothesizes that the "incentive" positively influences the "alignment".

1.9 Assumptions and limitations of the study

Conducting a scholarly research should include a critical analysis about the assumptions and limitations of it. It should recognize the shortcomings and the shortcomings of the choices made, and then adjusting the best way possible (Simon & Goes, 2011).

As it will be better explained, the research design is based on a survey methodology. It is assumed that people answer truthfully at every question. In order to make this assumption easier to be fulfilled, attention was paid to the way the questions were done, avoiding too personal aspects. For instance, when asking about incentives regarding compensation, questions did not ask about the wage amount, but the levels of the respondent satisfaction about his/her wage. Besides being a more suitable approach from a theoretical point of view, it also facilitates the sincerity of the answers. Furthermore, the survey will never reveal any identity, guaranteeing the confidentiality of the answers.

It is also assumed that the sample that will be chosen is representative, as possible. The definition of the sample should attend to certain criteria. The most important criteria used when choosing a sample is that it should represent the defined population (Almeida & Freire, 2008). The sampling process should guarantee the results validity and the possibility of generalizing the results to the population. Yet, it is difficult to guarantee the randomness of the used sample and so, instead of speaking of an assumption, we should refer to it as a limitation (Simon & Goes, 2011). The characteristics of the sample and some of their consequences on the representativeness of the sample that is used will better be discussed ahead.

On the other hand, Europe and, particularly Portugal, is under an unfavorable economic environment in the last years. A high unemployment, significative financial restrictions of families and firms and a tense social environment are causes for low employee morale. Having this study been conducted over a certain interval of time with a particular negative social atmosphere, it is probable that this snapshot reflects the conditions occurring during that time.

As it was already said, the unit of analysis of the survey is the enterprise. Yet, an enterprise cannot answer a survey and need someone to do that for it. The IT and business managers of surveyed firms were asked to answer a questionnaire. Consequently, at this study, the units of analysis (the enterprises) do not coincide with the units of observation (the individuals). This type of cross level

inference is misleading and should be approached with caution (Long, 2004). In order to minimize the limitations of this situation, respondents were carefully selected, according to their positions at each firm, so they were able to answer the questions, as accurately as possible.

Another typical limitation around any survey is related with their constructs. The constructs are built based on a set of items. Yet, some problems may exist relating the constructs and the items that are used for their operationalization. In order to limit those problems, construct validation took place. This will be explained later.

1.10 Research strategy

The research strategy is closely linked with the underlying philosophy of knowledge (how we come to know), usually known as the epistemology, which dominated this study.

Without denying the merits of other possible research perspectives, the adopted research strategy is based on the fundamental beliefs of post positivism. This vision of science assumes that reality exists but to be only imperfectly apprehendable because of basically imperfect human intellectual mechanisms and the fundamentally intractable nature of the phenomena. This concept of reality is usually known as “critical realism”, compared to the apprehendable concept of reality of positivism view, commonly called “naive realism” (Guba & Lincoln, 1994).

Although the philosophical worldview or paradigm of this research is grounded on the postpositivism, it is not limited by it. The classic postpositivism perspective is complemented with a pragmatic worldview, applying mixed methods research where inquirers freely draw both quantitative and qualitative approaches when they engage in their research (Creswell, 2009). This perspective will be better explained later.

Moreover, the adopted research strategy of this thesis is highly influenced by Jerry Luftman perspective about the alignment between business and IT and its assessment (Luftman, 2003). Luftman sustained that the primary objective of assessing the alignment is to identify specific recommendations for its improving. After the alignment is assessed, joining each of its dimensions, it is possible to identify specific actions necessary to ensure that IT is being used to appropriately enable or drive the business strategy. Yet, some of these actions do not appear by enactment. They need to be promoted by an adequate incentive policy. The research behind this study subscribes a model where incentives influence the alignment. So, it tests a model based on this relation.

This thesis uses a statistical technique for testing and estimating causal relations, named the structural equation modeling. This technique usually subscribe to the Popperian notion because whenever the researcher found a particular "good" model, there are many other equivalent models that could also fit the data. Indeed, the SEM technique also echoes Popper’s view, where verification is impossible and only the falsification is possible. The conclusion that can be taken is that when data does not disconfirm a model, there can be many other models that are not disconfirmed either (Banerjee, Banerjee, & Paul, 2011).

Considering the two methods of reasoning, deductive and inductive approaches, this thesis will use the first one. The adoption of a deductive thinking process is based on a certain "feeling" from the

researcher when conducting the research that a certain theory may support one or more hypotheses that can be tested based on certain observations, and finally, refuting, or not refuting the hypotheses. A schematic representation of deductive reasoning is presented at the Figure 4.

Indeed, based on a preliminary literature review, the author of this research developed a conviction about the importance of incentives influence on the alignment. As testing and refuting or not the hypotheses are the final objectives, deductive reasoning appeared as the most logical reasoning approach (Trochim & Donnelly, 2008).

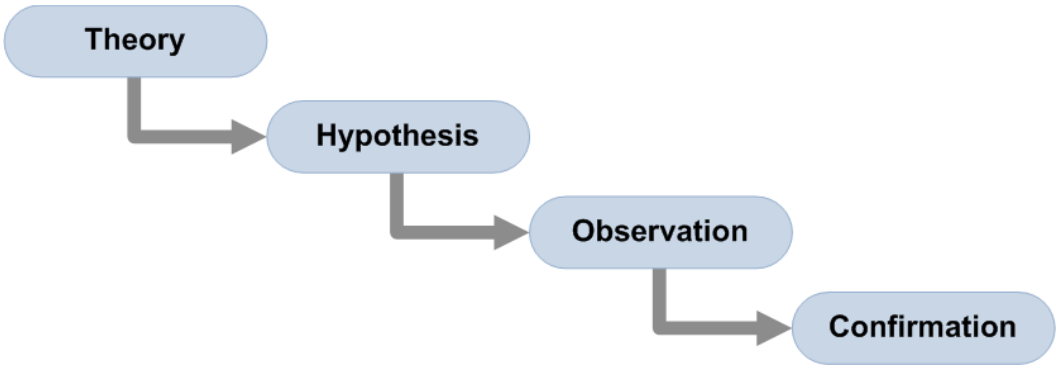


Figure 4: A schematic representation of deductive reasoning
Source: Adapted from Trochim & Donnelly (2008)

The deductive reasoning is based and begins with a central research question, which is stated in the context of some theory that has been advanced to address the problem. It is around this question that the literature review is done. Then, a statement, known as an hypothesis, is enunciated, suggesting, in operational terms, what will happen in the study. Narrowing down even further, observations to address the hypotheses are collected. Finally, it is possible to test the hypotheses with the specific data and confirm, or not, the original theory.

The research design and the associated research methodology will be better presented further down.

1.11 Structure of the thesis

This first chapter has introduced the main problem of this investigation and its correspondent motivation. It also presented the definitions of most important terms that are used at this document. Then, it stated more clearly the problem, the purpose and the importance of this study, its main research questions and also summed up the theoretical framework, the scope of the study, a simplified research conceptual model and some assumptions and limitations of it. Finally, this chapter exposed a overview of the research strategy that will be better explained further on. The rest of this document has five more chapters.

A detailed literature review around the alignment of business and information technology, motivation and incentives issues, already summarized at chapter one, is properly presented and detailed in chapter two. This chapter is basically divided in two parts. The first part concerns the alignment and the second part the motivation and incentive.

Then, the research methodology is presented at chapter three. This chapter presents and explains the choice and some specificities concerning the survey method, the structural equation modeling, the used instrumentation, the population and the sample, the several phases of the methodology, the validation strategy, the used tools and some ethical considerations.

The chapter four presents and describes the collected data and the corresponding findings. It also presents a brief case of one company, showing its specific maturity assessment of the incentive and the business-IT alignment. Furthermore, the chapter also presents the model assessment results (measurement model and structural model).

The major findings are presented at chapter five. The results presented at the previous chapter are then discussed and interpreted by different angles, respectively, by the functional area of respondents, by respondents' gender, by respondents' generation, by companies' economic activity, by each one of the manifest variables of incentive and alignment and by companies' size. Finally, the results of the proposed model are discussed and interpreted and the research questions formulated at the first chapter are analysed according to the findings.

The last chapter presents the contributions and implications of this research, its limitations, some recommendations for practice and for future research and the final considerations.

2 LITERATURE REVIEW

This chapter summarizes the literature review that was made. First, it will make an introduction and present the nature of the literature review. Secondly, it will present most prominent models, theories and research about business-IT alignment. Thirdly, most important theories and models about motivation and incentive are presented.

2.1 Introduction

There are different review types and associated methodologies that can support a research. As this study will address two bodies of knowledge, each one justifies a specific type of review.

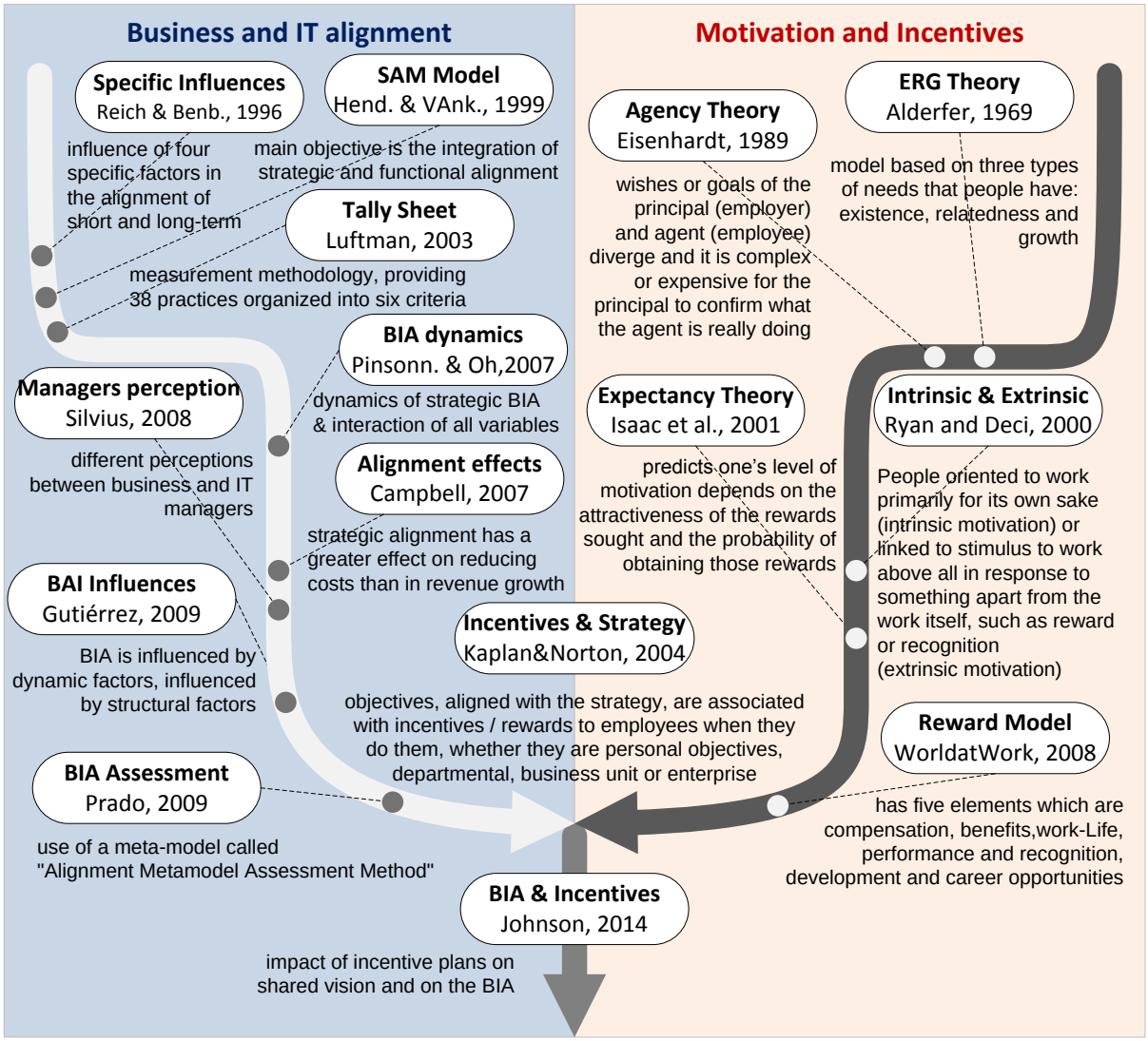


Figure 5: Literature map with key readings on alignment and motivation and incentives

The business-IT alignment area is the central concern behind this study, and so, as an exhaustive and comprehensive searching method was considered to be more suitable, the strategy was based on a systematic review typology. Regarding the area of motivation and incentive, as this is a complementary body of knowledge of this research, the idea was to get a summary of the main

literature, and so, an overview review was made (Grant & Booth, 2009). The next two sections will better depict the two reviews that were made.

The Figure 5 illustrates a literature map with main references showing the positioning of this study within both larger bodies of knowledge. This figure is divided in two key research domains. The left side of this figure shows the key readings on business-IT alignment and the right side shows the most important references about motivation and incentives.

2.2 Business-IT alignment

A systematic review was made to support an exhaustive and comprehensive search about the business-IT alignment subject (Grant & Booth, 2009). According to some recommended practices to conduct a systematic review, several steps were carried out to capture, evaluate and summarize the literature (Creswell, 2009). First, some preliminary readings allowed the identification of most important keywords about the business-IT alignment topic. Second, these keywords were used to search for important references in computerized databases of major libraries, namely the Google Scholar. Although other references were also considered, the journal articles and books were considered priority references. The Appendix 1 presents an excerpt of the concepts' matrix of the literature review that was made.

This section presents a summary of most prominent models, theories and research about business-IT alignment. As it is not practicable to present all the identified and reviewed references, only some were selected and summarized to be presented here. The criterion used to select most important references about the alignment was those that had a higher number of citations. The Table 1 presents the most cited literature that will be thereafter summarized. This session will also shortly present some other references that were also considered pertinent.

Reference	Main rationale	Key perspectives, factors and other important aspects	Number of citations *
Kaplan and Norton (1996, 2004, 2006, 2010)	Balanced Scorecard as a Strategic Management System	Four key processes for managing the strategy: • translating the vision • communicating and linking • business planning • feedback and learning	6.422
Henderson & Venkatraman (1992, 1993, 1999)	Strategic alignment model (SAM)	All strategies need to address both external and internal domains: • strategic integration • operational integration	3.015
Reich & Benbasat (1996, 2000)	Model of factors influencing the social dimension of alignment	Four factors influencing the alignment: • shared domain knowledge • history of IT implementation success • communication between executives • connections between business and IT planning processes	1.251
Chan, Huff, Barclay & Copelan (1997)	Strategic alignment model based on the strategic orientation of business and IT	Two research models ("systems" and "bivariate") were tested based on: • strategic alignment of the IS • business strategic orientation • strategic orientation of the IS • IS effectiveness • business performance	1.243
Sabherwal & Chan (2001)	Strategic alignment model based on different business and IS strategies	A research model was tested based on different business strategies: • defender • analyzer • prospector	1.034
Luftman & Brier (1999, 2000,2003)	Maturity assessment of the alignment Sustain the alignment	Criteria to assess the alignment maturity: • Communications Maturity • Competency/Value Measurement Maturity • Governance Maturity • Partnership Maturity • Scope & Architecture Maturity • Skills Maturity	918

* Number of citations of most cited references accounted on Google Academic on May 03, 2016.

Table 1. Most prominent literature concerning business-IT alignment

(a) The balanced scorecard supporting the alignment by Kaplan and Norton

The balanced scorecard (BSC) is a management system that comprises not only the operational level of an organization, but also its tactic level and strategic level. It emphasizes the idea of having an information system, with either finantial or non-finantial measures, for employees at all levels of the organization. The measures are derived from a top-down process, driven by the mission and strategy of the business unit, into tangible operational objectives and measures (Kaplan & Norton, 1996b). The external measures for shareholders and customers, the internal measures of critical business processes and the innovation capability, usually assured by learning and growth initiatives, should be "balanced" when defining every measure of the scorecard.

Although the first balanced scorecard design is assigned to Art Schneiderman in 1987, while he was Vice President of Quality and Productivity at Analog Devices, Inc (Schneiderman, 1999), it was Kaplan and Norton that have made this idea really popular among academics and practioners. Today, the balanced scorecard publications of those two authors are among the most cited references of the management body of knowledge (Kaplan & Norton, 1996a, 1996b).

On the centre of the BSC approach, there are four key processes for managing the strategy; respectively translating the vision, communicating and linking, business planning and feedback and learning (see Figure 6).

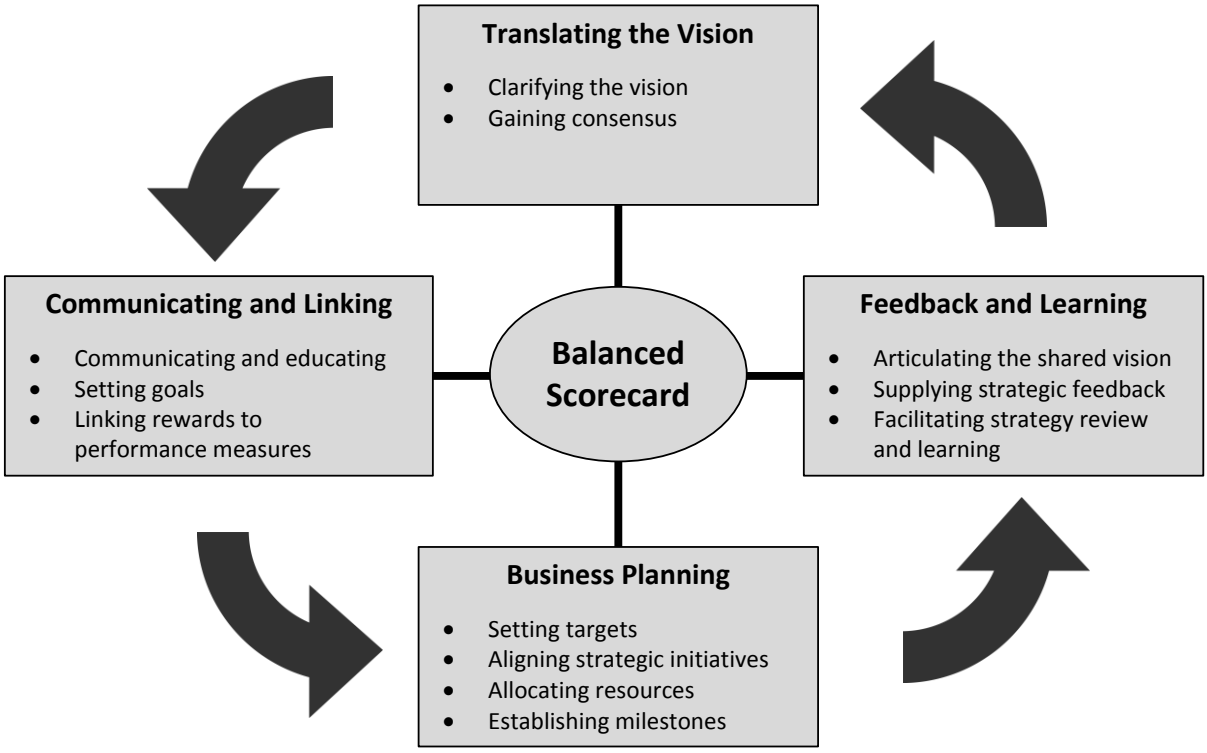


Figure 6: Four processes to manage strategy according the balanced scorecard
Adapted from Kaplan & Norton (1996b)

Behind the idea of designing balanced scorecards there is the objective of aligning. Actually, "the value of deploying scorecards from the top to the bottom of the organization is particularly beneficial in providing alignment of improvement activities" (Schneiderman, 1999). Also, the planning, the target

definition and the alignment strategic initiatives are some of the identified critical management processes that may be accomplished by balanced scorecards (Kaplan & Norton, 1996a). Indeed, Kaplan and Norton considered that the alignment should be a crucial concern of organizations. This was evident on the title of one of the books that those two authors published and that was precisely baptized as "Alignment: Using the balanced scorecard to create corporate synergies". The alignment idea of Schneiderman and, specially, of Kaplan and Norton, boosted through the balanced scorecards, is very embracing.

According to those authors, alignment should hold external concerns, as aligning the business with the requests of external stakeholders, like shareholders and customers, and it should also look inside the organization, seeking to align internal processes and the learning and growth strategies that better satisfy the shareholders and customers (Kaplan & Norton, 2006).

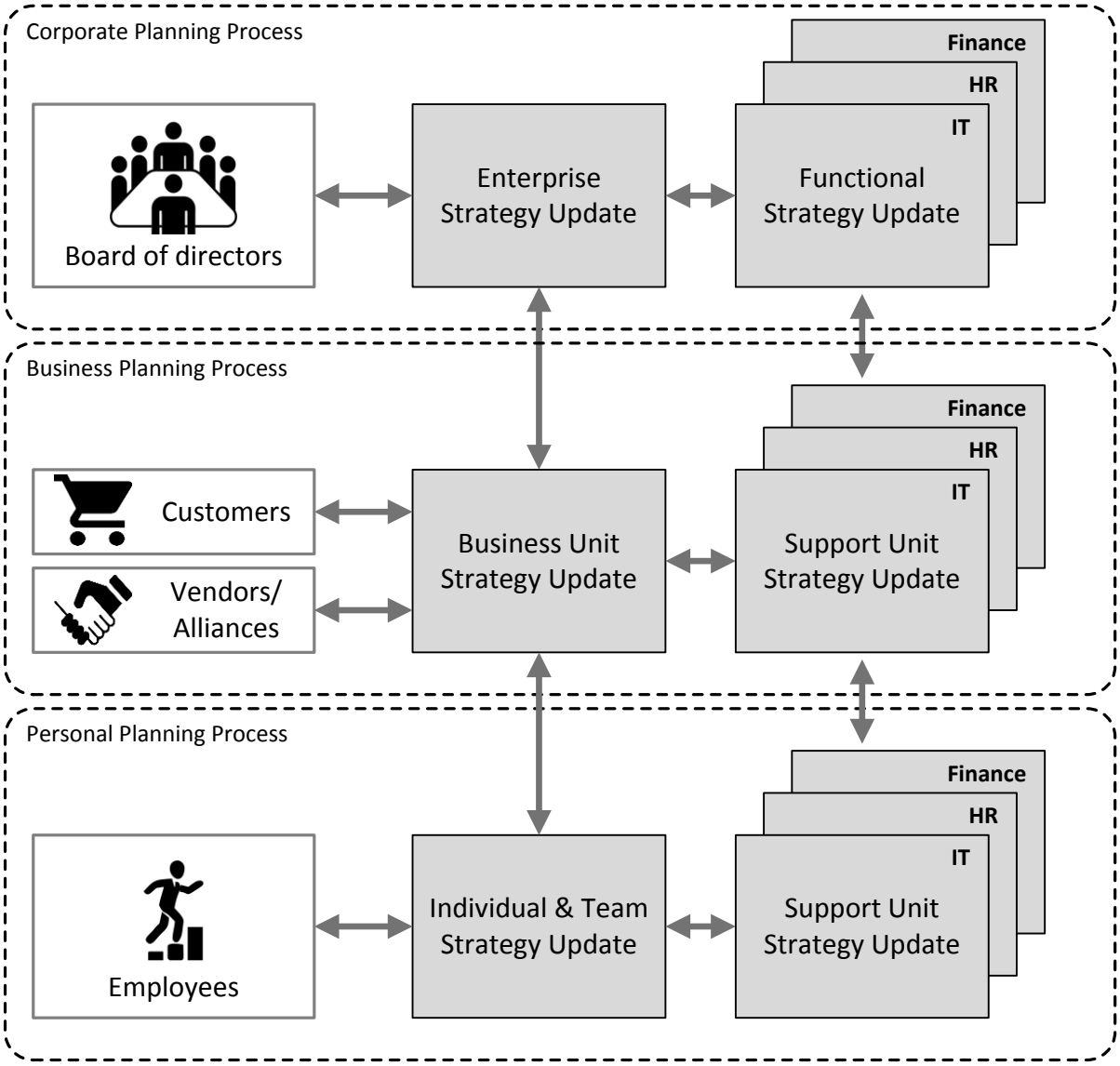


Figure 7: Building alignment into process planning
Adapted from Kaplan & Norton (2006)

The alignment of internal support and service units with enterprise and business units should be considered one of the organization central concerns. Units, frequently working as shared-services, such

as the human resources, the information technology, the finance, and the planning, may use the balanced scorecards to support the strategies of the business units and the enterprise to develop their strategies, their long-term plans and their priorities (Kaplan & Norton, 2006). Actually, the recommendation of designing specific scorecards for functional areas like the IT is corroborated by well known IT frameworks, like the COBIT (ITGI, 2007) or the ITIL (Taylor, 2007). The alignment should be viewed as a process in order to avoid a fragmented and uncoordinated manner of doing things that difficultly creates synergy and value (see Figure 7). This process should be cyclic and should be have a top-down approach (Kaplan & Norton, 2006).

Although the sphere of the alignment of Kaplan and Norton, potentially boosted through the balanced scorecards, is not specifically limited to the alignment of the business with the information technology, it also includes it. The balanced scorecard approach favors a really comprehensive insight about the alignment in general, and about the business-IT alignment in particular, giving managers a way of ensuring that all levels of the organization understand the long-term strategies of business and IT and that both departmental and individual objectives are aligned with it (Kaplan & Norton, 1996b).

There are three levels of information in the balanced scorecard. The first level corresponds to the description of corporate objectives, measures, and targets. The second level translates corporate targets into targets on each business unit. The third level, encompassing a personal scorecard, should ensure that the objectives of individuals and teams are consistent with the objectives of business unit and the corporate and also that individual initiatives ensure the achievement of those objectives (Kaplan & Norton, 1996b). By communicating the corporate and business unit objectives to the people and teams that do the work, this allows the conversion of higher level objectives into meaningful tasks and targets on personal scorecards of those employees. With such personal scorecards, employees may keep continuously in mind their personal objectives and priorities. Indeed, as it can be seen at Figure 6, the communication and linkage from a top level to the personal level is so important that it was highlighted as a key process proposed by the balanced scorecard perspective, including the communication and education, the establishement of goals and the linkage of rewards to the performance measures. The Figure 7 adapted the building alignment into process planning proposed by Kaplan and Norton (2006), adding the third personal level discussed above.

Kaplan and Norton (2004) refer to the strategic alignment as a two-step process. Initially, managers communicate the high-level strategic objectives to all employees in a way that everyone can understand. At this stage, the attempt is to create intrinsic motivation and inspiration for all staff to help the organization's success. In a second phase, it is used extrinsic motivation, by setting targets at various levels, from personal to global. These objectives, aligned with the strategy, are associated with incentives / rewards to employees when they do them, whether they are personal objectives, departmental, business unit or corporative (Kaplan & Norton, 2004, 2006).

In short, a balanced scorecard boosts the traditional financial measures with benchmarks for performance. Definitely, the balanced scorecard perspective proposed by Kaplan and Norton is a very important contribution to the alignment concern on organizations. The conviction behind the balanced scorecard perspective, that individual and team objectives and their correspondent incentives should be necessary lined up with the objectives of the business unit and the corporate level, in order to

guarantee an enhanced global alignment and organizational performance, definitively feeds the underlying rationale behind this thesis.

(b) Strategic Alignment Model (SAM) by Henderson and Venkatraman

The most cited model of business-IT alignment is, undoubtedly, the one proposed by Henderson and Venkatraman (1992, 1993). This model, known as the Strategic Alignment Model (SAM) identifies the need to specify two types of alignment between the business and the IT domains. Firstly, the strategic integration, which corresponds to the link between the business strategy and the IT strategy and reflects the capability of IT to both shape and support the business strategy. Secondly, the second type of alignment corresponds to the link between the organizational infrastructure and its processes and the IT infrastructure and its processes, designated by operational integration.

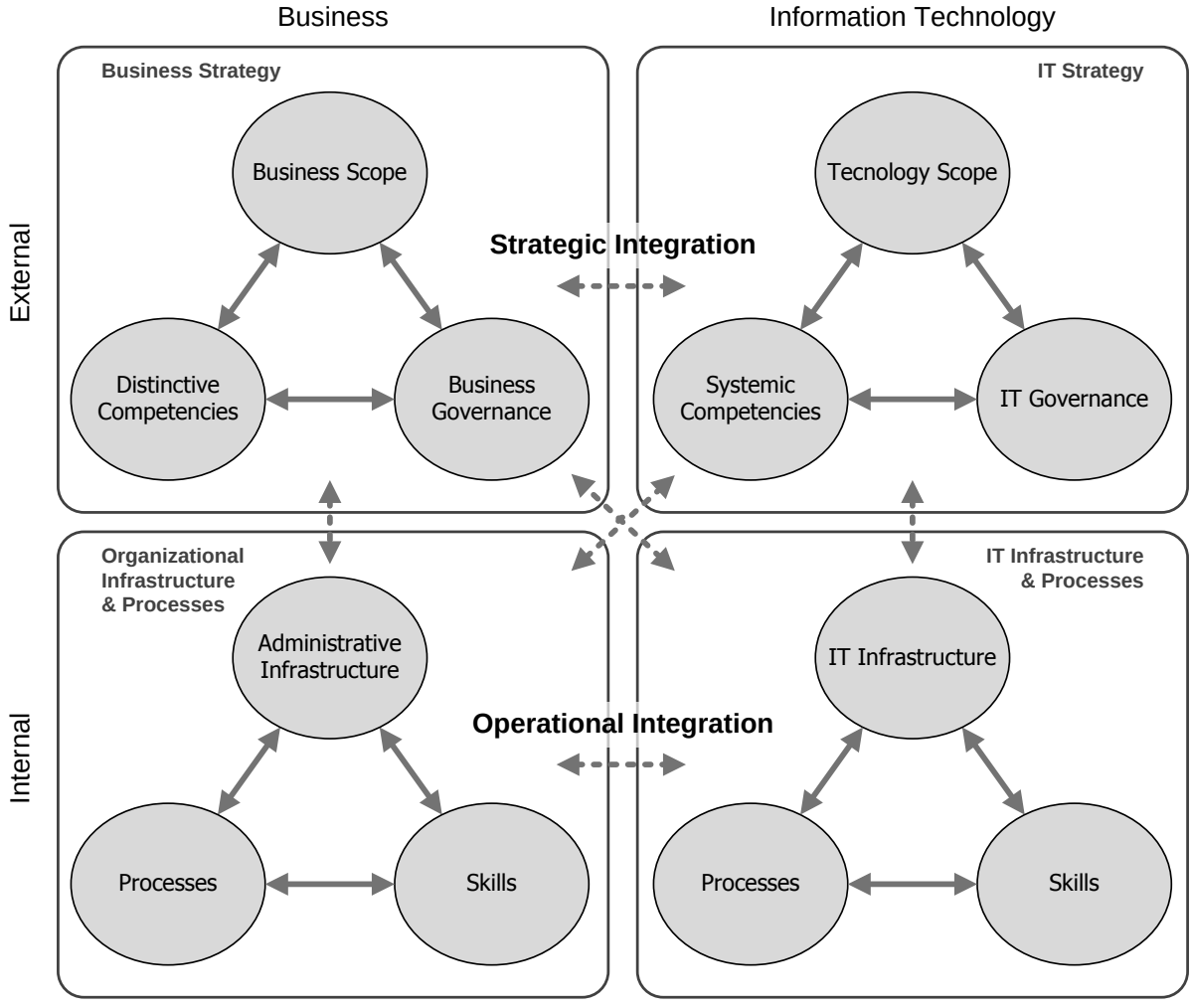


Figure 8**:** Strategic alignment model
Adapted from Henderson & Venkatraman (1993)

The alignment proposal of Henderson and Venkatraman states the need for any strategy to address both external and internal domains. Moreover, the functional dimension of alignment is based on both business and information technology sides and their respective components. By crossing these two dimensions, it is possible to draw four domains, as illustrated in Figure 8.

At the business side, the external domain comprises decisions as product-market offering, possibly trying to differenciate the firm from its competitors or "make-versus-buy", partnerships and aliances decisions. The internal domain, at the business side, is concerned with administrative decisions and their associated processes, as product delivery, product development, customer service or total quality.

At the IT side, the external domain concerns the position of the organization in the IT market place. This involves strategic decisions at the technology scope like adopting expert systems or robotics, systemic competencies as system reliability, interconnectivity or flexibility and the IT governance, which is concerned with decisions as joint ventures with vendors or the development of new IT capabilities. The internal domain of the IT is concerned with systems arquitecture and the portefolio of software and the hardware and communications configuration. As at the business side, it also comprises the IT processes and correspondent skills.

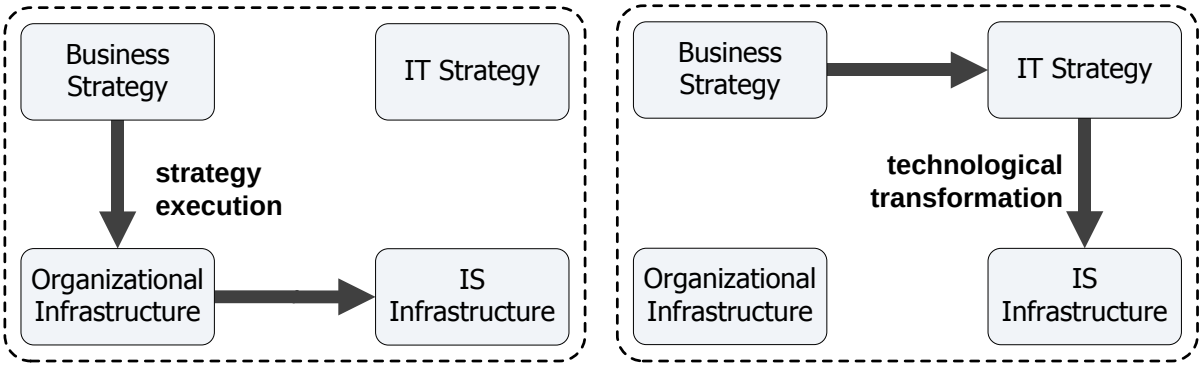


Figure 9**:** Two dominant alignment perspectives with business strategy as a provider
Adapted from Henderson & Venkatraman (1993)

The strategic alignment model proposed by Henderson and Venkatraman (1993, 1999) also allows four dominant alignment perspectives according to these authors. Each perspective represents a possible direction which runs three of the four quadrants identified in the model.

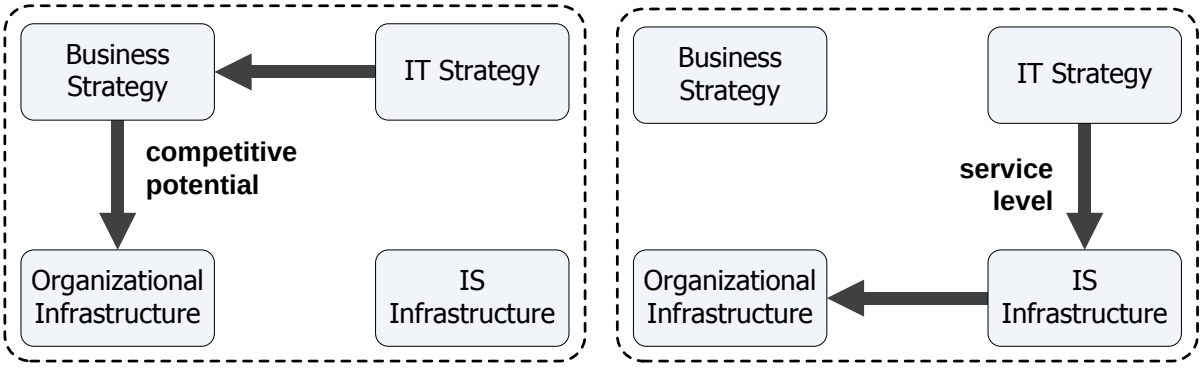


Figure 10**:** Two dominant alignment perspectives with IT strategy as a provider
Adapted from Henderson & Venkatraman (1993)

The Figure 9 and Figure 10 represent the four dominant alignment sequences proposed by the Henderson and Venkatraman model. Two perspectives are based on business strategy as a provider of alignment and the other two are based on the strategy of IT. The "strategy execution" one starts in

business strategy, influences the organizational infrastructure and finally the technological infrastructure. The "technological transformation" perspective begins on business strategy, then moving on to the IT strategy, and finally to the technological infrastructure. The "competitive potential" begins in the IT strategy, determines the business strategy and then the organizational infrastructure. Finally, the prospect of alignment of the "service level" which begins in the IT strategy, then adapts the technology infrastructure and finally the organizational infrastructure (Henderson & Venkatraman, 1999).

The four perspectives proposed by these authors and later developed by others (Avila, Goepp, & Kiefer, 2009), intended on one hand, to characterize the nature of the sequence, planned or emergent, and the alignment paths between the strategic area of business and the organizational and processes structure and, on the other hand, the strategic importance of IT and its technological infrastructure.

(c) Factors influencing the social dimension of alignment by Reich and Benbasat

Reich and Benbasat proposed the concept of social dimension of alignment, stating that it refers to the state in which business and IT executives understand and are committed to the mission, objectives, and plans of business and IT.

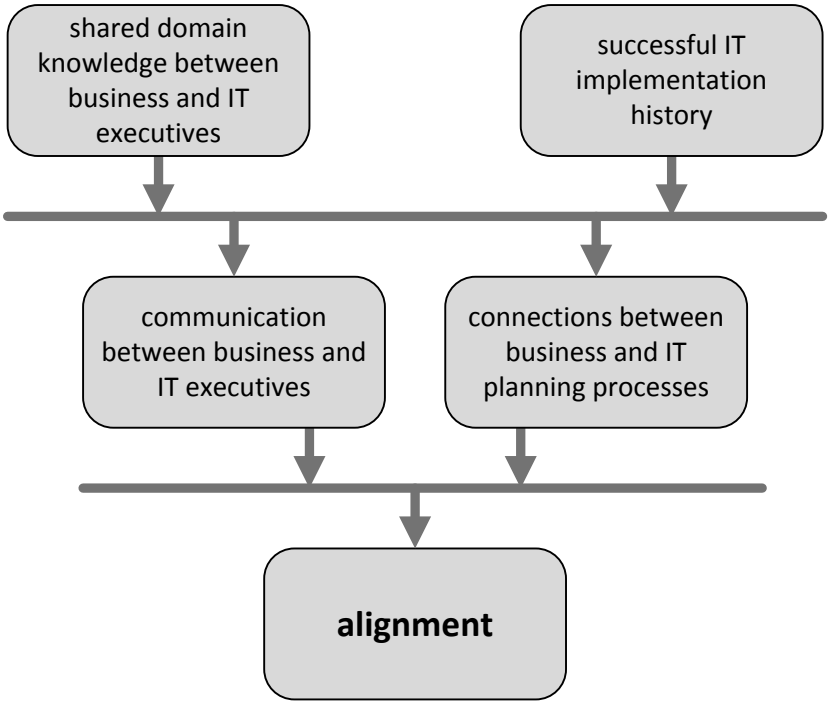


Figure 11**:** Model of factors influencing the social dimension of alignment
Adapted from Reich and Benbasat (2000)

The model proposed by Reich and Benbasat included four factors, potentially influencers of the alignment and is illustrated at Figure 11. These factors are the shared domain knowledge between business and IT executives, the history of IT implementation success, the communication between business and IT executives, and the connections between business and IT planning processes (Reich & Benbasat, 1996, 2000). The model also proposed the distinction and a differentiated analysis of the short term alignment (the degree of mutual understanding of current objectives between business and

IT executives) and the long term alignment (the congruence of IT vision between business and IT executives).

The proposed research model was tested with the help of a total of 57 semi-structured interviews to 45 informants. Besides the interviews, other sources of data were collected and analyzed, as written strategic plans of business and IT, minutes from IT steering committee meetings, and other strategy documents from each of the 10 business units.

After rating each factor and the alignment for each one of the 10 business units, these results were analysed and some relations of the proposed model were confirmed. These research found that all four factors in the model (shared domain knowledge, IT implementation success, communication between business and IT executives, and connections between business and IT planning) influence short-term alignment. There was only one factor, the domain knowledge, that influenciated the long-term alignment. Both the short and the long-term alignment were found to be influenced by a new factor; the strategic business plans.

(d) Business strategic orientation, information systems orientation and strategic alignment model by Chan, Huff, Barclay and Copelan

The study of Chan, Huff, Barclay and Copelan about business and IT alignment is one of the most cited references in the literature. Their conceptual model is represented at Figure 12.

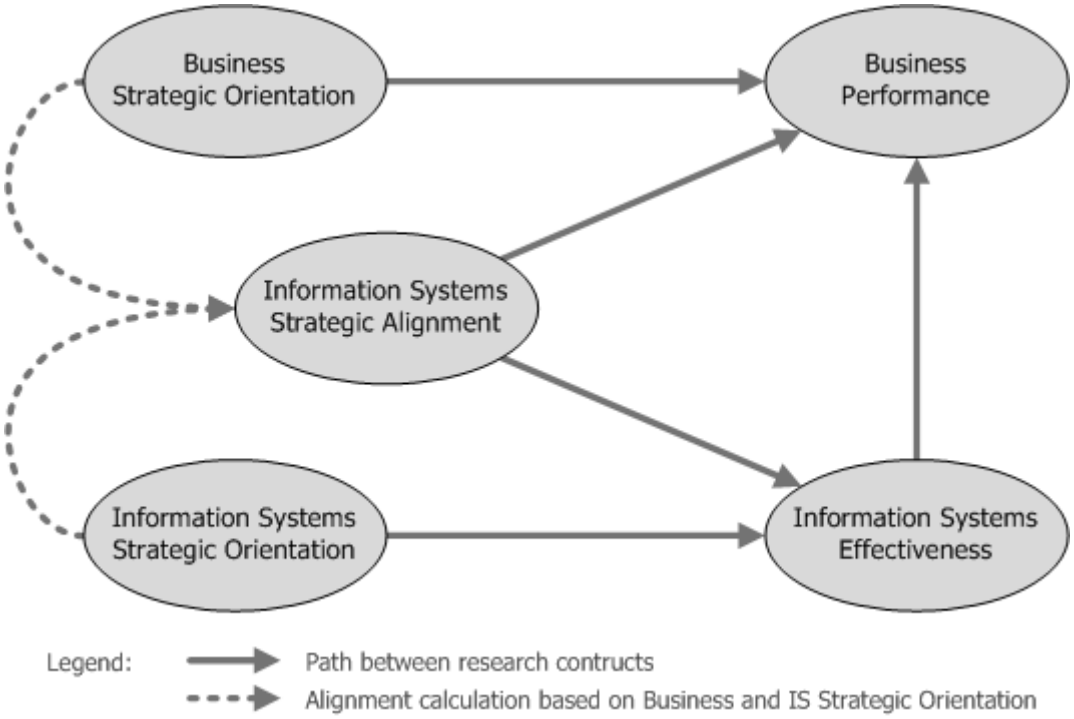


Figure 12**:** Conceptual model with strategic alignment as the fit between business strategic orientation and strategic orientation of the information systems
Adapted from Chan, Huff, Barclay and Copelan (1997)

These authors proposed a model where the strategic alignment of the information systems (IS) is calculated based on the fit between the business strategic orientation and the strategic orientation of

the information systems. Also, the model argues that alignment directly influences the IS effectiveness and business performance. Furthermore, it claims that the realized IS strategies affects IS effectiveness and that business strategies affects business performance (Chan et al., 1997).

In order to carry out the test of this model, four measurement instruments were developed, respectively, for the business strategic orientation, IS strategic orientation, information systems effectiveness and the business performance. Then, the Dun and Bradstreet directories were used to compile a list of 1200 North American firms operating in the finantial and the manufacturing industries, and a mail survey was administered to those firms. A complete set of questionnaires was gathered from 164 companies.

The Partial Least Squares (PLS) technique was used to make the parameter estimation and the statistical tests of the relationships between the constructs illustrated at Figure 12. Two approaches were tested. The first, the "bivariate" approach, has considered unidimensional strategic orientation's constructs from the business and the information systems side. The second approach considered a "systems" view, where the unidimensional constructs relationships are used to feed a higher-order level that support the alignment construct. Both two research models were tested, considering all constructs as reflective, with the exception of the strategic alignment construct. The "systems" model was found to be more useful than the "bivariate" model. The path coeficients of all the five relationships were statistical significant ($p<0.01$). Yet, the strategic alignment was found to be a better predictor of business performance than business strategic orientation. Similarly, alignment was also found to be a better predictor of information systems effectiveness than the strategic orientation of information systems.

In short, besides the importance of confirming that all the relationships in this model were significant, these findings also suggested that alignment works better if considered with a higher-order level supporting the alignment construct. Finally, this model also highlighted the higher influence of the alignment on the information systems effectiveness and on the business performance, comparatively to the business strategic orientation and the IS strategic orientation, respectively.

(e) Alignment between business and information systems strategies - A study of prospectors, analyzers, and defenders by Sabherwal & Chan

Another highly cited research is the one proposed by Sabherwal and Chan that has modeled and tested the alignment between business strategy and information systems strategy according to the well known classification of Miles and Snow's of defender, analyzer, and prospector business strategies. According to this classification, the defender kind of management has the stability as its main priority, by deliberately enacting and maintaining an environment for which a stable form of organization is appropriate. On the contrary, the prospector does not pursue stability, but prefers to browse an environment that is more dynamic, trying to maintain a reputation as an innovator in product and market development. Most of the times, this management assumes they may sacrifice the profitability to sustain product and market innovation. As the defender and the prospector seem to represent complete opposite strategies, there is a third type of strategy, called the analyzer, that tries to combine the prospector and defender types and represents a viable alternative to these other strategies. In

short, an analyzer is an organization that attempts to minimize risk while tries to maximize the opportunity for profit (Miles, Snow, Meyer, & Coleman, 1978).

According to Sabherwal and Chan, there are reasons to believe that there are different information systems strategies more appropriate for the three business strategies. Those authors believed that the "IS for efficiency", "IS for flexibility" and "IS for comprehensiveness" are the informations systems strategy types that are best aligned with the Defender, Prospector, and Analyzer types of business strategy, respectively (Sabherwal & Chan, 2001).

Different instruments were developed to measure the business strategy attributes, the IS strategy attributes and the business performance. The Dun and Bradstreet directories were also used to compile lists of North American firms operating in financial services and pharmaceutical and auto parts industries. Different types of respondents (CEO, CIO, CFO, and a senior end user) of those firms were then asked to complete the questionnaires. Empirical data from answers of multiple respondents of two surveys (the first with 164 companies and the second with 62 companies) were received and analyzed.

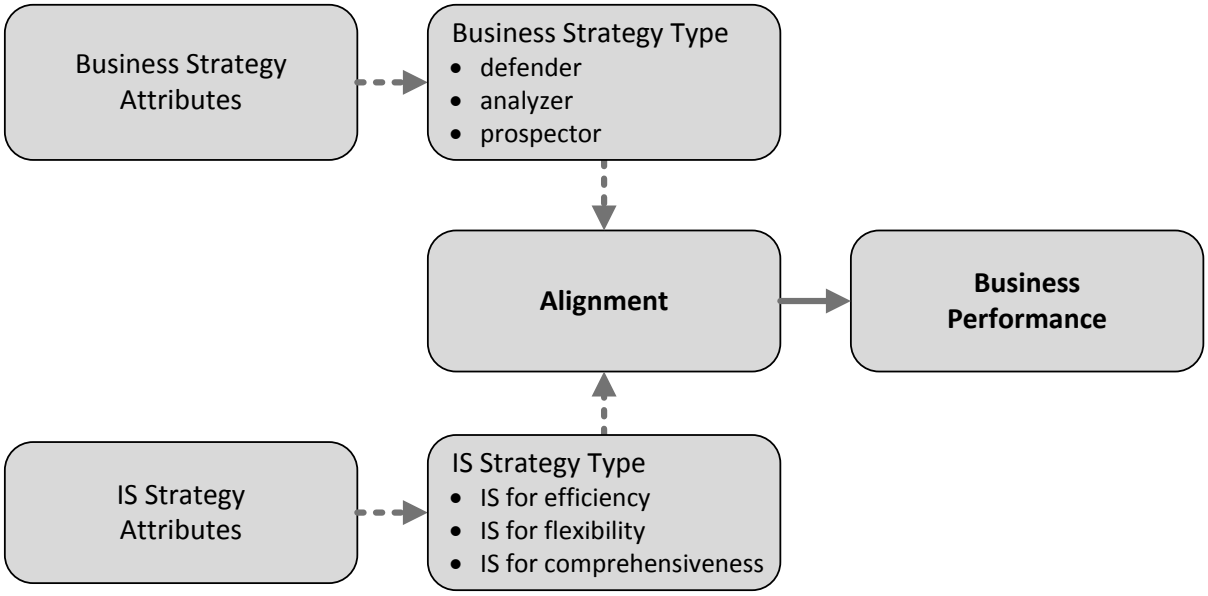


Figure 13: Alignment conceptual model based on different types of business strategies and information systems strategies
Adapted from Sabherwal & Chan (2001)

The Euclidian distance between each firm's business strategy and the ideal business strategies of each one of the three groups was computed, which allowed classifying each company into one of the three business strategy types. Finally, also using the Euclidian distance between each firm's information systems strategy and the ideal information systems strategy for the business strategy type it belonged, it was possible to compute the alignment for each company. The Figure 13 presents the alignment conceptual model proposed by these two authors.

The results of theses surveys showed that alignment affects the perceived business performance, but, this was not true for all the organizations. This finding seems valid for the prospectors and analyzers companies. Yet, this relation seems not to happen at defenders companies.

In short, this study suggests that alignment is associated with the company's business success. Yet, the significance of the association between alignment and business success depends on the business strategy. For example, prospectors companies find more useful to implement certain system as market information systems or strategic decision support systems instead operational support systems. However, at defenders companies (15 companies were classified as so), this association seems not to be observed. These firms, emphasing stability, operational efficiency, and economies of scale, were classified as defenders, and, seemed that rarely search outside for new business opportunities, rarely prefering to make major adjustments to their information systems (Sabherwal & Chan, 2001).

(f) Assessing and sustaining the business-IT alignment by Luftman

Another important issue concerning the alignment of Business-IT refers to its assessment. Although several other researchers have already proposed different ways to assess the alignment, the approach proposed by Luftman has been one of the most adopted one.

Before Luftman formally proposed his well-known approach to assess the maturity of the alignment in 2000, another previous works from him, Brier and Papp revealed the most important success factors and inhibitors of the alignment, some main components of the alignment and also discussing the strategic alignment as a process (Luftman & Brier, 1999; Luftman, Papp, & Brier, 1999).

Enablers of the alignment	Inhibitors of the alignment
• Senior executive support for IT • IT involved in strategy development • IT understands the business • Business-IT partnerships • Well-prioritised IT projects • IT demonstrates leadership	• IT/business lack close relationships • IT does not prioritise well • IT fails to meet commitments • IT does not understand the business • Senior executives do not support IT • IT management lack leadership

Table 2. Success factors and inhibitors of business-IT alignment
Adapted from Luftman & Brier (1999)

After a survey and posterior interviews to a set of executives representing over 500 firms in 15 industries, it was possible to rank the six most important enablers and inhibitors of the alignment (Luftman & Brier, 1999). The Table 2 presents the ranking of those factors and inhibitors.

Indeed, those emerging factors and inhibitors were the required foundation for the consequent development of a proposal made by Luftman of an instrument behind his strategic alignment model maturity (Luftman, 2000; Luftman, 2003).

The assessment of the alignment's maturity of an organization proposed by Luftman, also known as the Strategic Alignment Model Maturity (SAMM), comprises five levels of strategic maturity, respectively:

1. Initial/Ad Hoc Process

2. Committed Process
3. Established Focused Process
4. Improved/Managed Process
5. Optimized Process

These five levels are somehow coherent with the simple maturity scale proposed by the IT framework COBIT (ITGI, 2007) to measure and follow how a process evolves from a non-existent capability to an optimized capability.

Variable	Questions to be answered
communications	• How well the IT professionals understand the business and viceversa? • How well the business professionals understand the IT? • How rigid or fluid is the communication? • How well is the knowledge shared? • What type of relationship exists between the business and the IT staff?
competency/ value measurement	• How embracing are the IT and business metrics on IT projects? • What kind of links exist between business and IT metrics? • How detailed and embracing are the IT service level agreements? • How formal is the assessment of the IT investments? • What type of improvement practices exist?
governance	• How formal is the business and the IT strategic planning? • What kind of organizational structure and reporting relationships exist? • How are the IT projects decided and budgeted?
partnership	• What is the business staff perception of IT? • What is the IT's role in strategic business planning? • What is the type and how is the IT–business relationship managed?
scope and architecture	• What is the technological and strategic sophistication of systems? • How integrated, transparent and flexible is the infrastructure?
skills	• How ready is the organization for change in this dynamic environment? • Are the individuals personally responsible for business innovation? • Can individuals and organizations quickly learn from their experience? • Are innovative ideas and the spirit of entrepreneurship leveraged?

Table 3. Questions at business-IT alignment variables
Adapted from Luftman (2000, 2003)

Each of the five levels of alignment maturity is supported, in turn, on a set of six following criteria: communications maturity, competency/value measurement maturity, governance maturity, partnership maturity, scope and architecture maturity and skills maturity (Luftman, 2000). The Table 3 presents a set of questions that should be answered on each one of these criteria (variable).

The Appendix 2 presents the detailed instrument proposed by Luftman to assess the maturity of the alignment, composed by those six criteria and evaluated through 38 business practices, from level 1 up to level 5 (Luftman, 2003). This instrument will be better depicted ahead.

The strategic alignment should also be seen as a process that seeks to attain and sustain the business-IT alignment. It is focused on understanding the maturity of the alignment through an appropriate utilization of this instrument, maximizing alignment enablers and minimizing its inhibitors (Luftman, 2003).

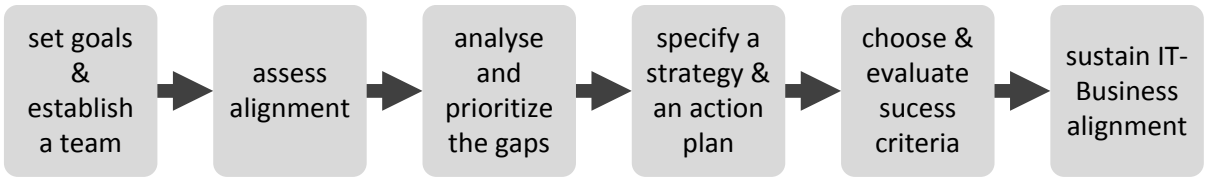


Figure 14: A six-step approach to achieve and sustain Business-IT alignment
Adapted from Luftman and Brier (1999)

The Figure 14 presents a six-step approach to achieve and sustain the business-IT alignment, evidencing that the alignment is an ongoing, dynamic and complex process, where the assessment of the alignment is just one of the steps in this process (Luftman & Brier, 1999). Also, as it can be seen, the effort is not just in achieving a better company alignment, but also in sustaining it.

(g) Other interesting theories, models and perspectives concerning the alignment

Another important model is the one proposed by Peppard and Ward (2004). This model, depicted in Figure 15, underlines the influence of Information Systems (IS) on competencies in four areas: business strategy, the strategy of IS/IT, business operations and the operations/services of IT. The model also explains that organizational performance is derived directly from the operations associated with business such as sales, production, marketing, logistics, customer service or research and development and not directly from IT operations.

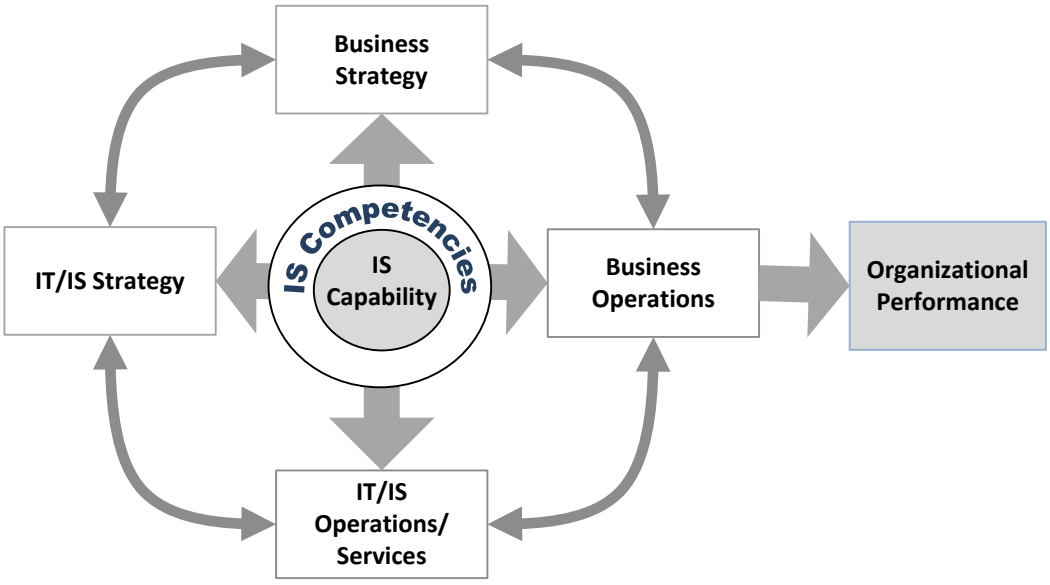


Figure 15**:** IS/IT alignment model: IS capability & organizational performance

Adapted from Peppard & Ward (2004)

One of the main originalities of this model (Peppard & Ward, 2004) compared to the previous other model in which this model was inspired, namely the SAM model proposed by Henderson and Venkatraman (Henderson & Venkatraman, 1993), is that it focused its attention on competencies in IS/IT. These competencies will, with greater or lesser extent, in a more or less adequate way, influence the business strategy, incorporating IT opportunities and influencing the efficiency of business operations, providing them with systems and technology support and designing and equipping the infrastructure of IT.

According to the model proposed by Peppard and Ward (2004), the competencies will also allow to specify and develop more suited investments in IS/IT to enhance and measure the benefits in business, by defining a suitable strategy for the IS/IT.

The dynamic nature of the alignment is evidenced by the model proposed by Benbya and McKelvey (2006), shown in Figure 16. This model emphasizes, in addition to the strategic and operational levels, a new level that was not evident in previous models: the individual level. The model, as its name suggests, highlights the dynamic character that it wants to represent the IS alignment problem.

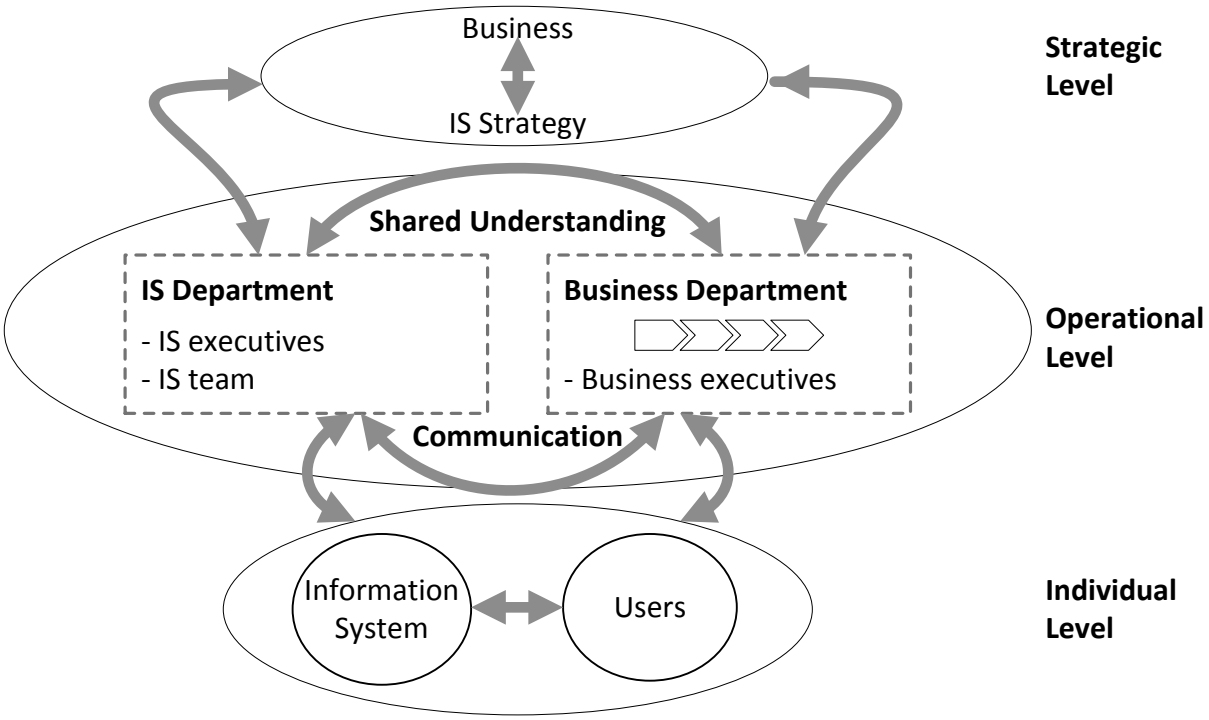


Figure 16**:** Co-evolutionary IS alignment model
Adapted from Benbya & McKelvey (2006)

Its authors, rather than defend a stable alignment, have a view that there are continuous series of adjustments within and between the three levels presented (Benbya & McKelvey, 2006). On the other hand, emphasize that there are several types of dynamic and multifaceted "co-evolutionary" perspectives; these dynamics can enhance the alignment or misalignment. Anyone can stimulate these dynamics, given its nature free, or at the top level (strategic) or the base level (individual) or to an intermediate level (in the business or information systems sub-components).

The inclusion of factors that influence the strategic alignment is proposed by Mendoza (2009), according to two categories, one of dynamic factors and other with structural factors (see Figure 17). The dynamic factors are those that result from the interaction between those involved in the formulation and the implementation of strategy. Structural factors refer to the cultural and structural forces that determine whether IS are or are not a partner which create business value through IT investments (Gutiérrez, 2009).

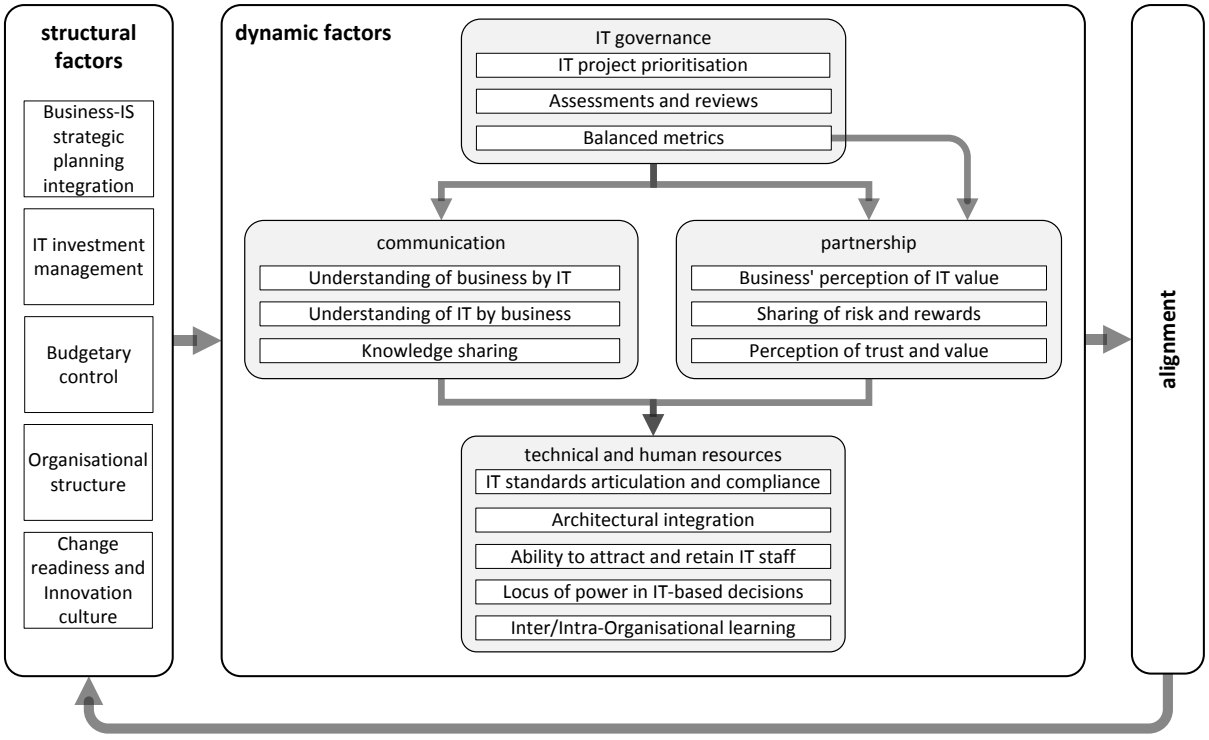


Figure 17: Inter-relationships between the factors affecting the information systems alignment Adapted from Mendoza (2009)

The investigation of Mendoza (2009), supported at an early stage by a case study and with a survey with a quantitative analysis at a later stage, highlights the most relevant factors, the most important relations between them and their final influence at IS alignment, according to the representation at Figure 17. According to this research, the structural factors are:

- Business-IS strategic planning integration
- IT investment management
- Budgetary control
- Organisational structure
- Change readiness and Innovation culture

For the dynamic factors, this author (Anabel Gutiérrez Mendoza, 2009) argues the following:

- IT Government (IT project prioritization, Assessments and reviews, Balanced metrics)
- Communication (Understanding of business by IT, Understanding of IT by business, Knowledge sharing)
- Partnership (Business' perception of IT value, Sharing of risk and rewards, Perception of trust and value)

- Technical and Human Resources (IT standards articulation and compliance, Architectural integration, Ability to attract and retain IT staff, Locus of power in IT-based decisions, Inter/Intra-Organisational learning)

Like Reich and Benbasat (2000) proposed before, Preston and Karahanna (2009) also proposed the shared understanding as an antecedent of the (strategic) alignment. Similarly, Preston and Karahanna identified two dimensions of strategic alignment, respectively, the social dimension of the alignment, focusing on shared knowledge and shared understanding among the IT and business actors about plans, objectives, and vision of the ways in which IT contributes to the success of the business and intellectual alignment, which is more concerned with the alignment of the strategy, infrastructure or processes. These authors developed a nomological network in which the shared understanding between the CIO and the top business managers (TMT) about the role of information systems (IS) in the organization is posited to be an antecedent of the intellectual dimension of alignment (Preston & Karahanna, 2009). Based on a survey that collected data from 243 matched CIO-TMT pairs and PLS technique, the results largely supported the proposed nomological network, especially, the fact that the understanding between the CIO and business managers is a significant antecedent of the strategic alignment. Additionally, the shared language, the shared domain knowledge, and the structural systems of knowing influence the development of shared understanding between the managers of IT and business.

A recent study within the thesis of Vess Johnson (2014), using precisely the framework proposed by Preston and Karahanna (2009) for the shared vision development and the agency theory as the theoretical lens, explored the impact of vision development factors and factors associated with incentive plans on shared vision and alignment.

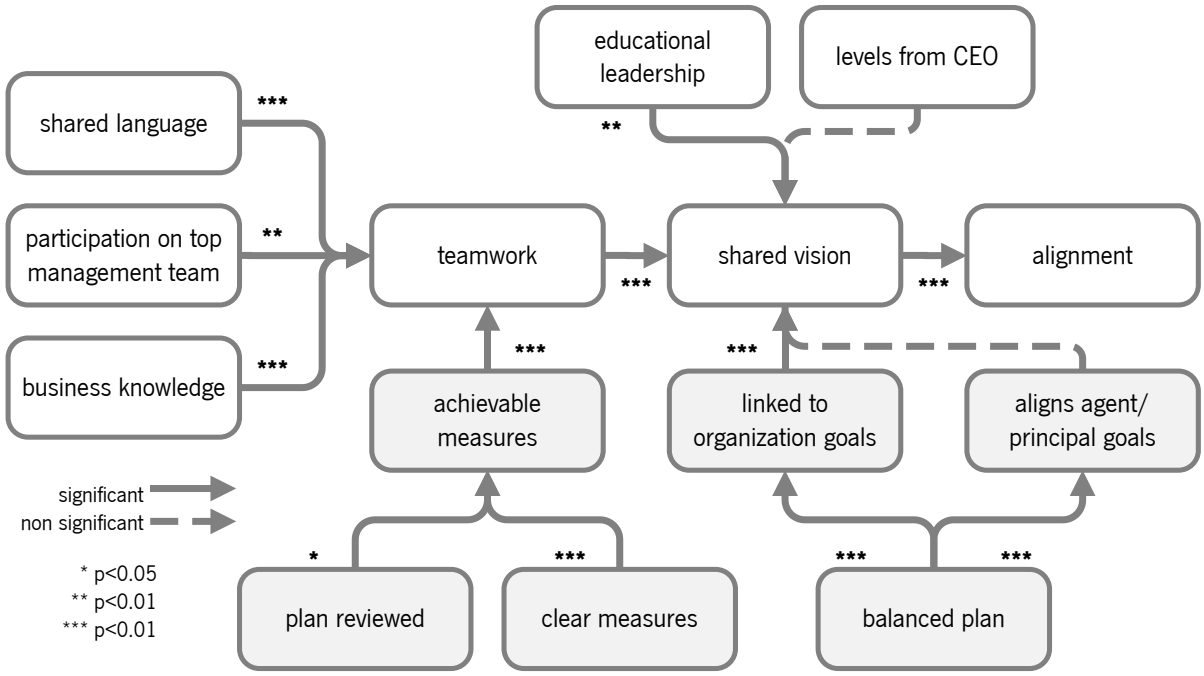


Figure 18: Structured model concerning the impact of vision development factors and incentive plans factors on shared vision and alignment

Like the study of Preston and Karahanna, the results of this study also confirmed the strong relationship between the shared vision and the alignment (see Figure 18). This study also revealed the importance of having an effective management team to develop and maintain a shared vision and the alignment within the organization (Johnson, 2014). In addition, incentive seems to positively impact teamwork and shared vision. In fact, attributes associated with incentive plans such as having achievable and clear measures, as having linkage to organizational goals, as aligning of the individual interests with those of the organization, as having regular reviews of the plan, and as using a balanced scorecard approach to support the incentive plan design, seem to influence positively the teamwork and the shared vision.

2.3 Motivation and incentive

An overview review about motivation and incentive area was made. The idea was to provide a broad and comprehensive summation of this topic area (Grant & Booth, 2009). This section will present most prominent literature about it.

(a) Maslow's hierarchy of needs theory

One of the most cited motivational references is the proposed by Abraham Maslow in 1943, called “A Theory of Human Motivation”, usually called the Maslow's hierarchy of needs theory. This theory proposed five types of basic human needs, respectively the physiological needs, the safety needs, the love needs, the esteem needs and the desires to know and to understand, known as the self-actualization needs (Maslow, 1943).

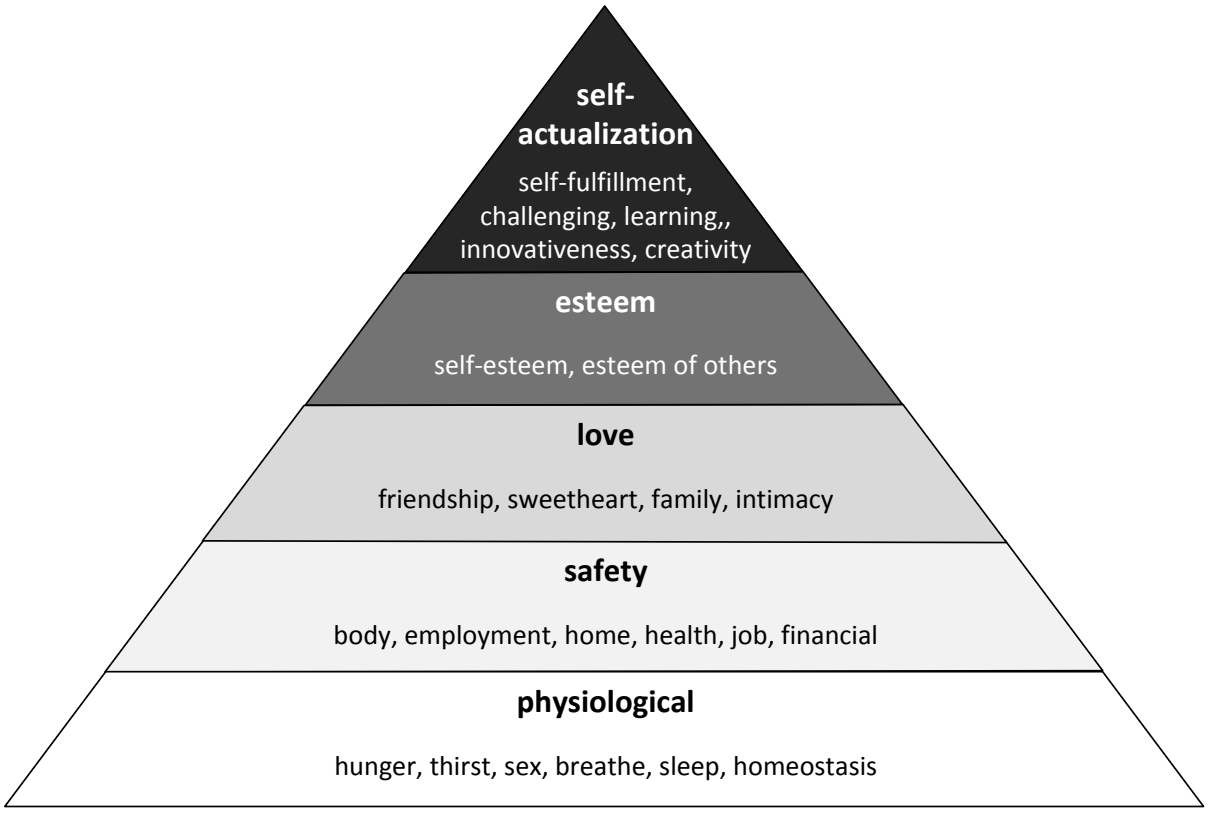


Figure 19**:** Maslow's hierarchy of motivational needs depicted as five levels of a pyramid

The Figure 19 shows the five levels of motivational needs and most important needs of each level. The Maslow's hierarchy of needs is often portrayed in the shape of a pyramid with the largest, most fundamental levels of needs at the bottom and the need for self-actualization at the top. According to Maslow, each person first needs to fulfill his/her most fundamental needs, represented at the bottom of the pyramid. If the fundamental needs are not fulfilled, then a person is not significantly feeling lack of higher level needs. For example, a person to whom is missing food, safety, love and esteem most likely will have more hunger for food than anything else.

The physiological needs are those associated with human survival and that should be met first. Every human body needs air, water, food and other metabolic requirements for survival. Furthermore, humans protect themselves from the elements of nature by using clothes and protecting themselves on shelters. As reproduction is also part of human survival, the sexual instinct and sexual competition are also considered physiological needs (Maslow, 1943).

When the physiological needs are reasonably satisfied, a new set of needs emerges. These needs, categorized as the safety needs, relate with the necessity a person has to feel physically safe enough from wild animals, extremes of temperature, criminals, assaults, murders, tyranny, war, natural disasters, family violence and other types of physical threats. The economic safety is also desired, leading people to prefer a job with tenure and protection or to have a saving account. Another type of safety need concerns health and well-being and may be typically satisfied by insurances, like medical, dental, disability or old age insurances.

Again, when both the physiological and the safety needs are reasonably satisfied, another kind of needs arises. Then, the love and affection and belongingness needs will be the new centre of the concerns. The necessity of having friends, a sweetheart, a wife, a children or affectionate relations with people in general, for instance, for a place in his group may become the main priorities of a person's life. At that moment, this person will struggle with great strength to reach these goals.

The esteem basically may work internally (usually known as self-esteem and which is about feeling good about ourselves) or externally (seeking social approval and esteem from other people). An employee, as part of the group of his company, will try to maintain or climb the company hierarchy, looking for the esteem and approval of the other company colleagues. Maslow sustained that before someone is admitted in a group and so achieving the need for belonging, first comes the acknowledgement (recognizing the person), then the approval (evaluating the person) and finally, the acceptance. The more approval he gains, the more esteem and consequent status, power and control he gets (Maslow, 1943).

Finally, even if all previously described needs are achieved, individuals may still feel unhappy and restless. If a person dreams to be someone, he/her may only be completely happy if he/her succeeds in reaching that objective. These objectives, if reached, give the sensation of self-fulfillment. They may be challenging projects, learning objectives, innovative or creative challenges. For example, a musician must make music, an artist must paint, a poet must write. Others desire to be an ideal mother, father or, for example, a great politician. This need is called self-actualization, depicting the expression that "what a man can be, he must be".

(b) The two-factor theory or the Herzberg's motivation-hygiene theory

Frederick Herzberg was a psychologist interested in studying the workplace motivations and its correlation with the employee attitude at the workplace. He wanted to find out what made people feel satisfied and unsatisfied when they came to the workplace.

So, he interviewed 200 engineers and accountants. Firstly, he asked them to recall a time when they had felt exceptionally good about their jobs and then, he asked them the reasons for their feelings of satisfaction. Secondly, in another set of interviews, the same persons were asked to describe events on the job that they characterized as exceptionally negative cases. Based on those interviews, Herzberg developed a theory in 1959 called the two-factor theory that is based on the assumption that there are two sets of factors influencing the motivation in the workplace (House & Wigdor, 1967).

According to Herzberg, the satisfiers or motivators are related to the nature of the work itself and the rewards that flow directly from the performance of that work. The individual's needs for self-actualization and self-realization in his work are the strongest motivators at work. These factors are achievement, recognition, work itself, responsibility, and advancement.

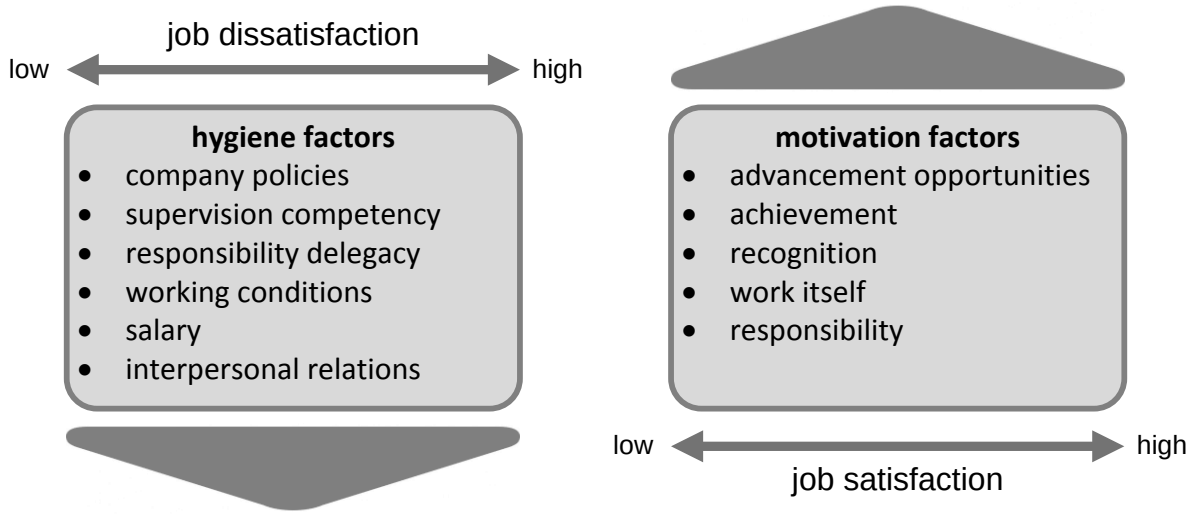


Figure 20**:** Main hygiene and motivation factors of Herzberg's two-factor theory

On the opposite side, the dissatisfaction factors are connected with the person's relation to the context or environment in which he does his work. The most important factors were found to be those related with company policies and administration that encourages the ineffectiveness of the inefficiency within the organization. The incompetency on technical supervision, the lack of knowledge of the job of supervisors or the inability to delegate responsibility and teach are considered the second most important factors. Other motives of discontent are working conditions, interpersonal relations with supervisors, salary, and lack of recognition and achievement.

Herzberg also sustained at the dual-factor theory of motivation that the satisfiers are effective in motivating a person to have a major effort and performance, but the dissatisfiers are not. So, once, and only after that happens, the hygiene issues are addressed, the motivators promote job satisfaction and

encourage production. The Figure 20 represents the main hygiene and motivation factors of Herzberg's two-factor theory and evidences their influence on job dissatisfaction or satisfaction, respectively.

(c) Existence, relatedness and growth needs

Alderfer theory (Alderfer, 1969), known as "Existence, Relatedness and Growth" (ERG) is a model based on three types of needs that people have: existence, relatedness and growth. Existence needs category includes physiological and safety needs (like hunger, thirst or sex), relatedness needs consist of social and external esteem (like involvement with family, friends, co-workers and employers) and growth needs embrace internal esteem and self-actualization (as desires to be creative, productive and to complete meaningful tasks). Somewhat inspired on Maslow's view (Maslow, 1943), the three categories proposed by Alderfer (Alderfer, 1969) are a kind of stairs with three levels. The lower level is the existence needs, the second is the relatedness needs and the higher level the growth needs. According to ERG, if an employee doesn´t manage to fulfill a higher category of needs, he may return to a lower level of needs category which seems to be easier to be satisfied. On the other hand, if he has a certain level of needs fulfilled he may try to accomplish the needs of a higher level. These possible changes on behaviour are characterized as frustration (regression) or satisfaction (progression) and may have a certain impact in the employee performance that should be evaluated. On the other hand, ERG Theory assumes that the order of importance of these three categories may not be the same for everyone. Each employee usually has several needs at the same time, so, managers should take that into consideration, defining a global perspective of incentives. It would probably be advisable to have different incentives´ approaches to IT or business managers and even to other levels of IT practitioners. ERG theory supports total reward strategy approach and has various usable components, according to organizations´ goals and strategies (Jiang et al., 2009).

(d) Vroom´s expectancy theory

According to Vroom (1964), most serious efforts to analyze and explain behaviour utilize motivation concepts as a major role. Beyond concepts of aptitude, ability, and skill, other concepts like need, motive, goal, incentive, and attitude are appearing with as much or great frequency.

Vroom believed that there is an effect of motivational variables on person's behaviour in work roles and there is an effect of work roles on motivational variables (Vroom, 1964). He proposed a theory, called the expectancy theory, that "predicts one's level of motivation depends on the attractiveness of the rewards sought and the probability of obtaining those rewards" (Jiang et al., 2009).

If employees perceive that they may get valued rewards from the organization, they tend to put greater effort into work. According to expectancy theory, the "motivation state" depends on the "expectancy" (E) about the relation between the effort invested by someone and the performance, result of that effort. The "motivational state" (M) is also dependent on the "instrumentality" (I) used to measure individual performance and the "valence" (V) given to each individual goal, and finally to the extent to which the person values the rewards received. The Equation 1 presents the relation between these variables.

$$M = E \times I \times V$$

Equation 1: The expectancy theory equation

These dependent relations and their recursive nature are represented at Figure 21.

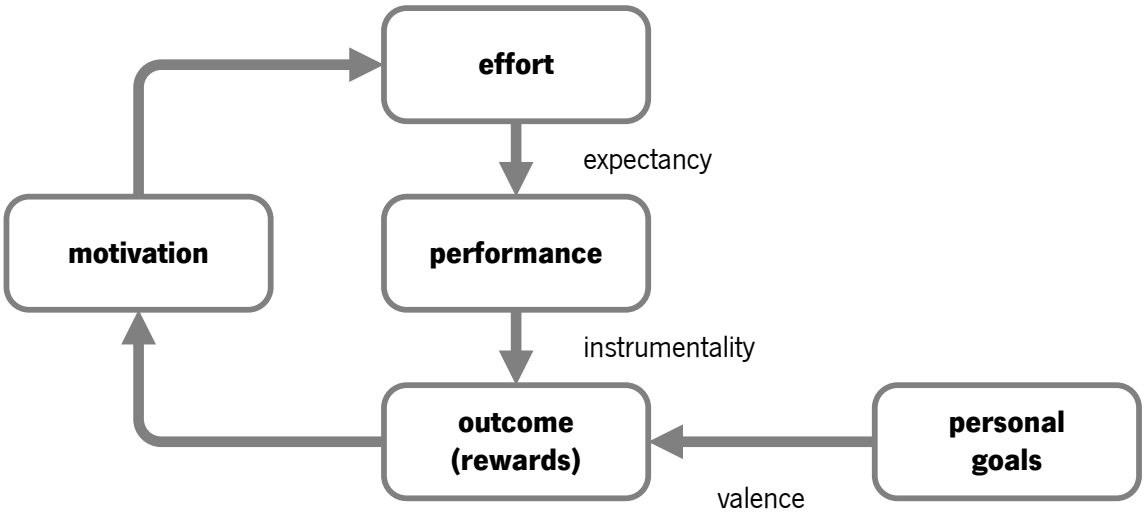


Figure 21**:** The Expectancy Theory model
Source: Adapted from Isaac et al. (2001)

The expectancy theory supports the best reward's strategies designed by companies. The three dimensions considered at this theory, respectively the expectancy, the instrumentality and the valence, are key and complementary perspectives that should be considered at a modern total reward strategy (Jiang et al., 2009).

(e) The principal-agent problem or the theory of agency

The concern of aligning the company goals, especially its traditional objective of profit maximization, with the objectives of its various members like the workers, the supervisors, the managers is behind the principal-agent problem or the theory of agency (Laffont & Martimort, 2001).

The presence of two individuals is the common element of the agency relationship. One of them, known as the agent, must choose an action from a number of possible alternatives. His action affects the welfare of the individuals, the agent and the principal. Before the agent choose the action, the principal has the function of prescribing payoff rules to the agent (Arrow, 1984).

The relation between the principal and the agent is very recurrent in modern economies. Indeed, in modern economies the agent is normally selected for his specialized knowledge and consequently it is almost impossible completely confirm the agent's performance (Arrow, 1968). The theory of incentives and the essence of incentive questions deal with the problem of delegating a task to an agent who has different objectives than the one who delegates this task (the principal), when information about the agent is imperfect (Laffont & Martimort, 2001).

There are generic agency problems arising in companies, like the majority and minority owner's relationships, the relation of the firm itself with its creditors, the relation of the firm with its lawyers or the relation of the firm with any other representatives in its relation with third parties. The relationship

that is most interesting for this study is the one coming from the relations of owners and managers in a corporate management context, represented at Figure 22.

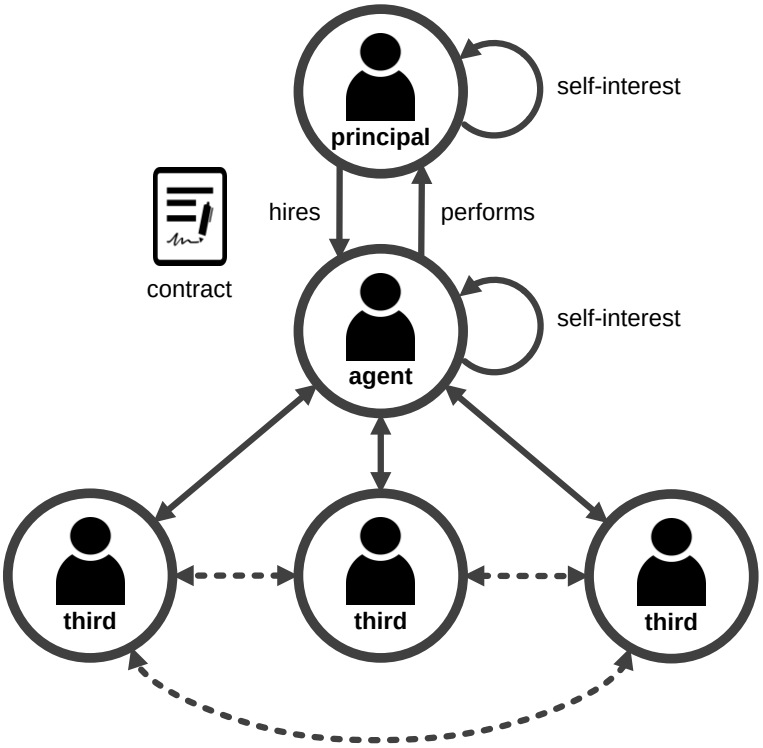


Figure 22: Main agency relationships of owners and managers in a corporate context
Source: Adapted from Casadesus-Masanell & Spulber (2007)

In a corporate context, the shareholders (principals) hire their representatives (agents) to perform certain activities for them, like buying or selling goods and services for them. The larger the organization is, the more need exist to delegate authority for engagement in economic transactions to representatives charged with sales, purchasing, hiring, finance and other organizational areas, like the IT. The agent is selling trust and the price of that trust corresponds to the incentives given by the principal to the agent. The agent organizes a network of third parties and connects with them. In a corporate context, the third parties behind the principal-agent relationship of the shareholder with the manager may be customers, suppliers or other employees who are under the command or guidance of the manager. Sometimes, third parties may connect with each other as well. If so, the principal may be able to acess to one of those third parties to interact with other third parties, giving the principal valuable information about other third parties and their relations. In that situation, the agent no longer have the monopoly of the interactions with third parties (Casadesus-Masanell & Spulber, 2007). Normally, the principal hires an agent because he does not have the time or the capability to do the work himself. In a corporate context, managers like the CIO, should have some specific technical and non-technical capabilities that are needed to perform this job.

The definition of an explicit contract of incentives of the owner with the manager is the main focus of the principal-agent model. The economic model of agency normally looks for to derive the best contract between the principal and the agent, grounded on the most suitable principles for the specific organization and coherent with the existing social, legal and market contexts (Casadesus-Masanell & Spulber, 2007).

On the centre of increase organizational performance initiatives there is the problem of trying the alignment of the interests of the employer and the employee, a particular principal-agent relation. The principal-agent problem focuses on the difficulties that occur under conditions associated with incomplete and asymmetric information when a principal employs an agent. The agency problem starts when the wishes or goals of the principal (employer) and agent (employee) diverge and it is complex or expensive for the principal to confirm what the agent is really doing (Eisenhardt, 1989).

As there are traditionaly different self-interests of the shareholder and the manager (see Figure 22), some mechanisms are used to align the interests of both these parts. An employment contract explicitly defines the obligations and rights of employers (principal) and employees (agent), trying to align worker interests with the interests of the principal. Schemes like commissions, bonus programs, short-term payment incentives like those based in individual performance, long-term payment incentives like stock options, or even other kind of rewards like insurances or health and welfare benefits are some of the different schemes that might be used to attempt the alignment of interests of the agent with those of the principal. The extension of rewards used by some organizations and practitioners may be very long and complete and may be analyzed under a "total rewards strategy" framework (WorldatWork, 2008).

The principal-agent problem starts in mainly employer/employee relations, for example, when stockholders employ top executives, like CEO (Chief Executive Officer) or CIO (Chief Information Officer). Agency theory is aimed at the agency relationship, in which one element (principal) delegates work to another (agent), which will do the job. One of the main problems here is that the principal cannot validate that the agent has behaved properly (Eisenhardt, 1989). This problem may be formalized by proposition 1.

Proposition 1. When the contract between the principal and agent is based on outcome, the agent is more likely to behave in the interests of the principal.

The other problem is the trouble of risk sharing that comes when the principal and agent have different behaviour towards risk. The principal and the agent might choose diverse actions for the reason of having different risk preferences. Recommendations say that agency perspective should be integrated in studies of several troubles having a cooperative structure (Eisenhardt, 1989). Proposition 2 resumes this problem.

Proposition 2. When the principal has information to verify agent behaviour, the agent is more likely to behave in the interests of the principal.

The principal recommendation of Eisenhardt (Eisenhardt, 1989) work is to include an agency perspective in studies of various problems having a cooperative structure. That is the case of an IT team in an organization. IT practitioners, when working in an organization, are employees as others, therefore general problems related with employer-employee relation affect them as well. IT professionals tasks, especially CIO ones, are clearly difficult to be validated by the principal. Usual tasks of CIO, include the planning and implementation of additions, deletions and major modifications to the supporting infrastructure company-wide in coordination with corporate leadership, overseeing the implementation of network security at the corporate level, anticipating future network needs, identification proactively solutions to satisfy needs. Specific competences normally also embrace the

management company-wide upgrade efforts, corporate help desk activities and resolves escalated issues if necessary, helping to establish and build relationships with vendors in conjunction with corporate leadership, overseeing all IT-related purchasing and budget usage; works with accounting to develop budgets or holding the responsibility for capacity planning and scheduling vendor negotiations related to IT (Alexandrou, 2010).

Some job descriptions include some organizational responsibilities as "innovator developer", which considers the participation in all programs and enforcement in all policies relating to performance evaluations and career development planning, reviewing of management evaluations for consistency, impresser upon management the importance of the career planning and performance evaluation programs, creator of an environment where innovators can successfully achieve professional career path goals, manager of the development of project managers and senior managers or even assigner of tasks to practice management that give managers an opportunity to grow (Alexandrou, 2010). The CIO is usually confronted with the responsibility of internal operations as reviewing status reports of project managers and senior managers and addresses issues as appropriate, lending expertise to internal teams and task forces or enforcing standard company policies and procedures. CIO and other IT jobs associated to Web and software development, project management, business analysis, relationship and vendor management, technical management, network engineering or IT infrastructure management, evidence specific competences or qualities that are difficult to become outcome based. Consequently, even with some specific particularities, these types of jobs may be classified as being principal-agent problem´s type.

It seems that the strategic BIA greater benefits to strategies oriented to reduce costs instead of strategies oriented to increase revenue (Pinsonneault & Oh, 2007). Agency theory may allow a better understanding of the specificities of IT executive view and their team relatively to the business and IT alignment problem. Different goals and risks perspectives from IT executive, business executive, theirs teams and stockholders should be identified.

(f) Intrinsic, extrinsic motivation and the Self-Determination Theory (SDT)

Definitions of reward are usually associated with "something given in exchange for good behaviour or good work" (Cambridge, 2010). It may be distinguishable between intrinsic reward, as "a positive outcome of performing work that is integral to the work task itself, such as love or pride in one's work, a sense of challenge or achievement" and extrinsic reward as "a positive outcome that is obtained by performing work but which is separate from and not inherent to the work task". The most evident extrinsic rewards are the pay and benefits that employees receive in return for work, though others might include praise from superiors and a sense of career progression" (Management, 2006).

According to Ryan and Deci, "to be motivated means to be moved to do something". Motivation may vary on the level of motivation (i.e., how much is a person motivated) and on the orientation of the motivation (i.e., what type of motivation that a person has). These authors presented definitions about intrinsic and extrinsic motivations and some new directions (Deci & Ryan, 2009; Richard Ryan & Deci, 2000a). Among other approaches, these authors contributed with the Self-Determination Theory (SDT), distinguishing between different types of motivation based on the different reasons or goals that give rise to an action. They argued that the most basic distinction between them is that intrinsic motivation

refers to doing something because it is inherently interesting or enjoyable, and extrinsic motivation refers to doing something because it leads to a separable outcome. Their review supported that experience quality and performance can be very diverse when one is behaving for intrinsic versus extrinsic reasons (Deci & Ryan, 1985b; Richard Ryan & Deci, 2000b).

(g) Managing incentives and motivation in practice

The reward systems should be carefully designed and should be embracing and include aspects as job enlargement, job enrichment, promotions, monetary, and non-monetary compensation (Lindner, 1998).

The variety of incentives that workers may receive from their work may vary a lot and the way these incentives plan are organized and managed can vary as well (Chelladurai, 2006; Milkovich, Newman, & Gerhart, 2011; WorldatWork, 2008, 2011).

Even there are others practitioners proposals, one of the most known reward model is the one proposed by WorldatWork (2008), an association representing professions comprising total rewards. The proposed model has five elements which are Compensation, Benefits, Work-Life, Performance and Recognition, Development and Career Opportunities.

Compensation is a payment provided by an employer to an employee for services rendered (i.e., time, effort and skill). It comprises fixed pay, variable pay, short-term incentive pay and long-term incentive pay. Benefits are programs used to supplement the cash compensation that employees receive, usually designed to protect the employee and his or her family from financial risks and can be categorized into social insurance, group insurance and payment for time not worked. Work-life consists in a specific set of organizational practices, policies, programs, combined with a philosophy which actively supports efforts to help employees achieve success either at work or at home, like workplace flexibility, paid and unpaid time off, health and well-being, caring for dependents, financial support, community involvement or management involvement/culture change interventions. Performance and Recognition is an essential constituent of organizational success. It promotes the alignment of the organizational, by team and individual performance assessment in order to understand what was accomplished, and how it was accomplished. It is composed by performance planning (that links individual with team and organizational goals), performance (demonstrates a skill or capacity) and performance feedback (communicate how well people do a job or task compared to expectations, performance standards and goals) and recognition that acknowledges or gives special attention to employee actions, efforts, behaviour or performance. At last, Development and Career Opportunities is composed by a group of learning experiences planned to improve employees' practical skills and competencies and a plan for an employee to precede their own career goals and may include improvement into a higher responsible position in an organization. Include Learning Opportunities, Coaching/Mentoring or Advancement Opportunities. According to this reward model Total Rewards is “the monetary and non-monetary return provided to employees in exchange for their time, talents, efforts and results” (WorldatWork, 2008). The Appendix 7 presents a complete checklist for the Total Rewards Model.

Another interesting aspect about incentives and rewards that may be interesting at this context is the understanding if larger incentives necessary promote improvement in performance. One of the latest researches results about this, developed by Ariely, Gneezy, Loewenstein and Mazar (2009), challenges the assumption that increases in motivation (through differential financial incentives schemes, based on the principle of "pay for performance") would necessarily lead to improvements in performance. Across multiple tasks performed by this research (with one important exception), higher monetary incentives led to worse performance. These researchers found that performance is superior for moderate financial incentives relative to very high financial incentives is consistent with the idea of having an optimal level of encouragement for executing tasks, further increases in arousals can lead to decrement in performance (Ariely, Gneezy, Loewenstein, & Mazar, 2009). Even there are several possible explanations; one mechanism by which increased motivation is likely to have a negative consequence on performance involves the focus of attention. Increased incentive tends to narrow individuals' focus of attention on a variety of dimensions. This can be unfavorable for tasks that involve insight or creativity, like those related with IT, since both require a kind of open-minded thinking that enables one to draw unusual connections between elements. As a result, many institutions providing very large differential financial incentives for tasks that require creativity, problem solving, and memory should rethink they incentive policy. Another not so explored incentives aspect is the one related with non-financial incentives impact on motivation. WorldatWork (2008) framework includes non-financial incentives aspects like those which are part of the main groups Work-Life, Performance and Recognition, Development and Career Opportunities.

According to Daniel Pink (2005), "the skills that made you successful yesterday will not make you successful tomorrow". And, another important concept refers that the majority of IT professionals use "left brain" skills, while tomorrow's job will require "right brain" skills. This job transformation, transitioning from the old skills to the new skills requires IT practitioners to move from technological skills to artistic skills. Furthermore, organizations should support and reward the new skills, in order to be prepared for the future (Pink, 2005).

2.4 The role of incentives on the promotion of the alignment

The previous sections of this chapter presented some of the most important studies concerning, on one hand, the business-IT alignment, and, on the other hand, the motivation and incentive topic. This short section ends this chapter focusing on some of those references that specifically have discussed the role of incentives on the promotion of the alignment. Although there are others authors that addressed the importance of incentives on the alignment in the past, it is worth highlighting the work of Kaplan & Norton (1996) that proposed using a balanced scorecard as a strategic information system to create corporate synergies that guarantee a better alignment among multiple businesses and supporting units, as the IT unit, and, more recently, the work of Johnson (2014) that specifically studied the effectiveness of some types of incentives on improving the alignment between business and IT.

As it was already presented above, Kaplan & Norton (1996) underlined the importance of combining corporate strategy with objectives at lower levels. By adopting a cascade down philosophy they argue that it is possible to tie strategic objectives to group objectives and then to individual

objectives, assessing its performance and linking it to the compensation system using "personal scorecards". Those authors defended a strategic management system with three levels (see Figure 7 at page 30). The first level describes corporate objectives, measures and targets, the second translates those first objectives into business unit's objectives and the third level should take into consideration each one personal objectives and integrate those into business objectives (Kaplan & Norton, 1996b).

The implementation and acceptance of a balanced scorecard at the department and the individual levels fosters a culture of alignment. A case study made at a medium-sized biopharmaceutical company showed precisely this evidence, in which four key management practices of the business-IT alignment (integrated planning, effective communication, active relationship management, and institutionalized culture of alignment) were enhanced by a wide implementation of a balanced scorecard tool at the enterprise. (C Derrick Huang & Hu, 2007). Indeed, it seems that, with correct management practices based on a balanced scorecard, each worker, from the top management team to the frontline employees, routinely take into consideration the alignment of his work with the corporate strategies.

Johnson (2014) studied the effectiveness of some types of incentives on the specific alignment between business and IT. Indeed, besides the results of Johnson's study have confirmed the strong relationship between the shared vision and the alignment (see Figure 18 at page 43), it also confirmed the positive influence that incentives seem to have on teamwork and on shared vision.

The proposed and tested model seems to evidence that incentives has, at least, a positive indirect influence on the intellectual dimension of alignment (Preston & Karahanna, 2009) and a direct positive influence on social dimension of the alignment (shared vision). A balanced (incentive) plan positively influences both the linking of measures to organizational goals and the alignment of the goals of agents and principals. Also, the linkage between the measures to organizational goals, the teamwork and the educational leadership positively impact the shared vision. Curiously, the alignment of the goals of agents and principals was not considered a significant predictor of shared vision.

In short, although there are a vast literature about alignment between business and IT or about motivation and incentives, there is not such a substantial number of references that relates these both areas. Nevertheless, the literature review that was made gives good indications about the pertinence of the subject and about the reasons to believe on this positive relation.

3 RESEARCH METHODOLOGY

3.1 Introduction

The research methodology is a way to systematically solve a research problem, including the planning and explanation of the various steps that are adopted by a researcher in studying his research problem and so, the logic behind them (Kothari & Garg, 2014). This section presents the research methodology of this study, namely the methods or tools that were used and the reason for that.

The design of a research proposal is associated with three complementary aspects (Creswell, 2009), respectively:

- Philosophical worldview
- Strategy of inquiry
- Research methods

The Figure 23 presents a framework for designing a research proposal which considers that a research design should be viewed as a plan or proposal to develop a research involving the connection of a philosophical orientation, strategies of inquiry and specific methods.

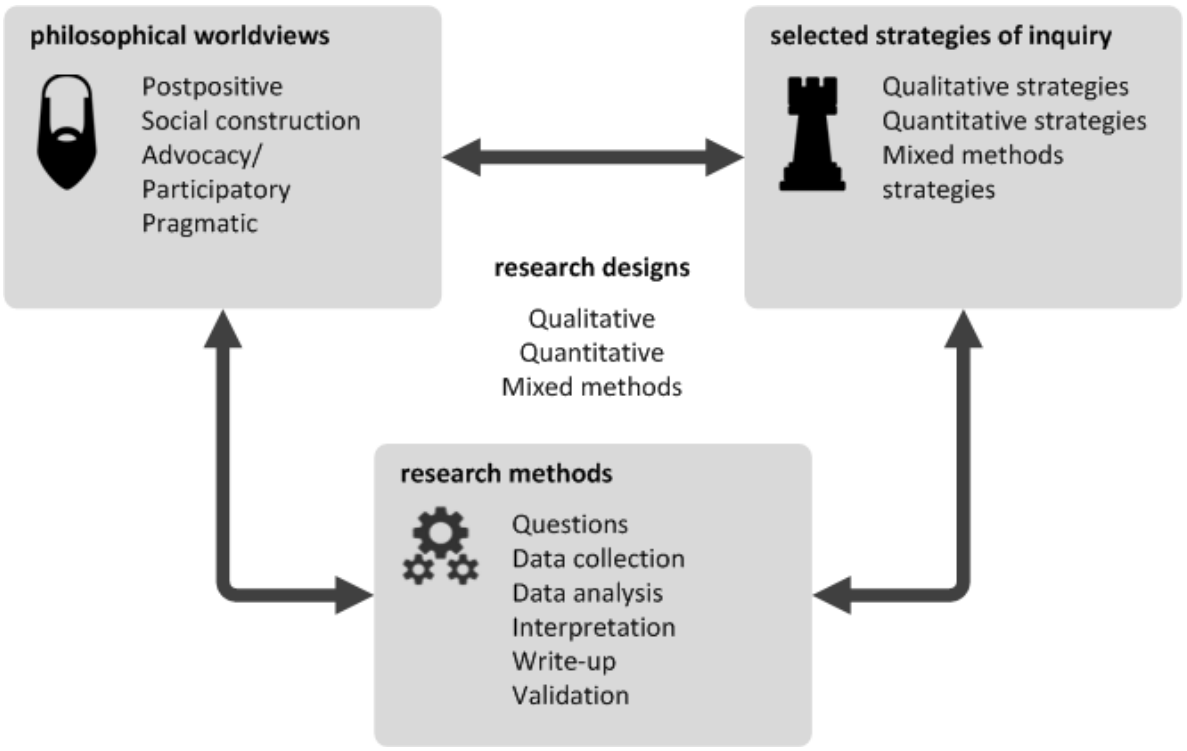


Figure 23: A framework for the design of a research proposal
Source: Adapted from Creswell (2009)

Usually, there is a certain philosophical worldview or paradigm that influences each researcher and his researches. This "basic set of beliefs that guide action" are typically molded by the discipline area of the researcher, his beliefs, his university faculty of the researcher and, probably, his past

research experiences. Some of the most important philosophical worldviews are the postpositivism, the social constructivism, the advocacy/participatory and the pragmatism.

My original discipline area is the engineering, whose traditional philosophical worldview is mainly the postpositive or postpositivism. Yet, the need to focus attention on a research problem as the alignment of business with the IT, with such an important social science side, recommends a pragmatic worldview for this research, using not only one, but different available approaches to understand the problem.

The postpositivism inherits some principles from the positivism. Both assume the phenomena have a material existence. This is based on the principle that the scientific theories are supported in empirical facts which can be tested through rational and systematic methods that explain or foresee the occurrence of the studied phenomena. A common benchmark of "rigor" is the internal validity which allows the isomorphism of findings with reality. Another one is the external validity, allowing the generalizability to a parent population. Additionally, there is the objectivity principle. It argues that social reality has an existence that is directly and independently observable relatively to a distanced and neutral observer (Guba & Lincoln, 1994).

Both positivism and postpositivism share the emphasis on measurement, design, and quantitative methods. Postpositivism vision may also include qualitative methods (Guba & Lincoln, 1994). Similarly, a qualitative approach was also used at this study to better define the instrument, either through a netnography methodology, used to give insights to an incentive policy, or through a pilot test which gave feedback about the instrument, allowing its improvement before its large utilization. Nevertheless, there is also an important quantitative approach of this thesis, by using a structured technique (web survey) to collect the data and doing a statistical analysis of that data.

However, the nature of knowledge at post positivism is slightly different from the positivism view. While at positivism, verified hypotheses are established as facts or laws, at post positivism, the knowledge consists on probable facts or laws, based on nonfalsified hypotheses, probabilistically apprehended (Guba & Lincoln, 1994). Karl Popper advanced the idea of falsification instead of the logical positivist idea of verifiability. According to him, “I shall not require of a scientific system that it shall be capable of being singled out, once and for all, in a positive sense; but I shall require that its logical form shall be such that it can be singled out, by means of empirical tests, in a negative sense: it must be possible for an empirical scientific system to be refuted by experience”. The degrees of two statements can be compared: “we can say that the one which is the less falsifiable is also the more probable, by virtue of its logical form” (Popper, 1959/2005).

The postpositivism worldview embrace a deterministic perspective in which causes probably determine effects or outcomes (Creswell, 2009). Instead of seeing the world as in the positivism, where there is an apprehendable reality that is driven by immutable natural laws and mechanisms, the reality, at the postpositivism, is assumed to exist but to be only imperfectly understood because of basically flawed human intellectual mechanisms and the fundamentally intractable nature of phenomena (Guba & Lincoln, 1994). The postpositivism is also reductionist, as although the reality is complex, it tries to reduce the ideas to be tested and the variables that cover hypotheses and research questions into a small and discrete set. Also, a careful observation and the measurement of the objective reality that

exists "out there" in the world is the support to the knowledge through the post positivist lens. A typical approach of a postpositivist research design starts with the researcher proposing a theory, second, collecting the data that either supports or refutes the theory, and then making the necessary revisions.

Although the philosophical worldview or paradigm of this research is grounded on the postpositivism, it is not limited by it, complementing it with other perspectives, not necessarily antagonistic. Instead of being committed to one system of philosophy and reality, the pragmatic worldview applies mixed methods research where inquirers freely draw both quantitative and qualitative approaches when they engage in their research. The pragmatism worldview arises out of actions, situations, and consequences rather than antecedent conditions (Creswell, 2009). It is not committed to just one set of philosophy and reality, but applies mixed methods. Instead of subscribing to only one way, a mixed method research looks to different approaches for collecting and analyzing data, using for example, quantitative or qualitative methods.

There are three basic design approaches. They are the qualitative, the quantitative and the mixed methods approaches. The design approach defined at this research can be considered a mixed method approach, as it incorporates both qualitative and quantitative elements in such a way that the qualitative and quantitative information complements each other.

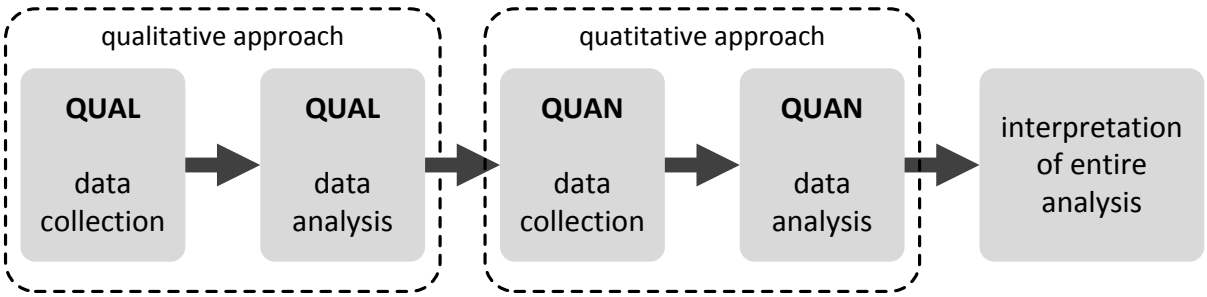


Figure 24: Sequential Exploratory Design
Source: Adapted from Creswell (2009)

Creswell proposed different ways of combining and sequencing the qualitative and quantitative methods at mixed method approaches. There are six major mixed methods models, respectively the sequential explanatory design, the sequential exploratory design, the sequential transformative design, the concurrent triangulation design, the concurrent embedded design and the concurrent transformative design (Creswell, 2009). The sequential exploratory design is the one that is most suitable for this research. The Figure 24 illustrates the sequence of this type of design.

This procedure is recommended when there is a need to develop an instrument because existing instruments are inadequate or unavailable. And, although the part of the instrument relatively to the alignment used at this research is not really new, because it is basically the one proposed by Luftman (2003), the other part of the instrument, relatively to the incentive universe, was developed for this purpose and so, it precisely fits at this recommendation.

Briefly, the embraced research methodology had a five stages approach. The first stage considered several parts. There was a detailed literature review, previously presented at chapter 2, which supported the first version of the instrument. This first version was then blind peer reviewed, with

several papers presented at conferences and published on academic journals. A pretest was also conducted, where several specialists were interviewed for validation of the instrument. At a second stage, the qualitative data collected was used to improve the instrument. This improvement process will be presented further in this chapter. Then, a quantitative approach stage was initiated, which included a pilot test of the instrument and the full scale survey, using an online survey. Although the approach of this stage has been mainly quantitative, there was still some interesting qualitative feedback from respondents that contributed to a better understanding of the phenomenon under study. After the quantitative data was collected, the correspondent analysis of the full scale survey data was done using the structural equation modeling (SEM) method and will be presented at chapter 4. Finally, the last stage was the interpretation of the entire analysis, basically presented at the chapter 5.

3.2 Survey method

The survey was the chosen method at this study. Indeed, the survey research became very popular in information systems. Their popularity is based on their easiness to administer, their simplicity to score and code, their easiness to determine the values and relations of variables and constructs, their generalization capacity to other members of the population studied and often to other similar populations, their capacity to be reused easily and provide an objective way of comparing responses over different groups, times, and places, their capacity to be used to predict behaviour, their capability to test theoretical propositions in an objective fashion, and their capability to help confirm and quantify the findings of qualitative research (Newsted, Huff, & Munro, 1998).

In fact, the survey is probably the most used and appropriate method to collect the necessary data in a study like the one proposed here (Almajali & Dahalin, 2011a, 2011b; Byrd et al., 2006; Chan et al., 1997; Chen, 2010; Cragg et al., 2002; Cragg, Mills, & Suraweera, 2013; Cumps et al., 2009; El-Masri, Orozco, Tarhini, & Tarhini, 2015; Evers, 2010; Kearns & Lederer, 2003; Luftman et al., 2010; G Mendoza, 2009; Sabherwal & Chan, 2001; Segars & Grover, 1999; Segars, Grover, & Teng, 1998; Sledgianowski, Luftman, & Reilly, 2008).

With the evolution and generalized adoption of web browsers, significant opportunities to conduct surveys using the web appeared. Compared to other classic survey modes, like telephone or face-to-face surveys, web surveys have relative low costs and are an easier way for data collection (Couper & Miller, 2009). Furthermore, web-based surveys may be attractive when global audience is important or large numbers of participants are involved, respondents have a rare condition or are part of unique populations, data need to be collected repeatedly or automatically linked to certain data definitions, data collection and analysis time need to be short, or cost control is important. Web-based surveys also support rapid checking of responses, the use of multimedia, the enforcement of branching between questions and rapid updating of questionnaire content (Belfo & Sousa, 2011c). Most of those reasons supported the decision of using a web survey to collect the necessary data for this study.

Yet, there are some disadvantages, potential problems or concerns when using web-based surveys. One potential problem is that these surveys are clearly restricted to those who are keyboard and Internet literate. Of course this is not supposed to be a problem at this study. Another possible concern is that a simple translation from paper format to web format may lead to significant changes in

the perception of what the questions and answers mean and, consequently, affect the validity of the survey. A constantly pointed problem in that kind of surveys, and probably their bigger concern, concerns their reduced response rates. This may be due to several reasons, like a certain survey fatigue, lack of recognition of usefulness, reduced personal motivation, difficult questionnaire interpretation or sense of use of excessive time and effort. All of these problems may also affect web surveys.

In the web, the survey process can be traced automatically using metadata and paradata that allows going beyond a limited categorization to the more classical behaviours. Using the web, besides complete responders, item nonresponders (they have viewed the entire questionnaire, but answered only some of the questions) and unit nonresponders (they may have viewed the welcome screen and, sometimes, for technical reasons, went no further), four other behaviours can be addressed: answering drop-outs, lurkers, lurking drop-outs and item non-responding drop-outs. Answering drop-outs are the respondents that having provided answers to all questions viewed, quit before completing the survey; lurkers are the ones that go through all the survey without providing any answer. Lurking drop-outs are the individuals that go through the survey without answering any question and also quit before reaching the end of the survey. Finally, item non-responding drop-outs are the respondents that quit before the end of the survey having answered some of the questions. A higher differentiation of response behaviours should allow for a better strategy to increase response rates. In fact, a web survey involving almost one and a half thousand respondents has shown a quarter of them being answering drop-outs, lurkers or lurking drop-outs (Bosnjak & Tuten, 2001). To be effective, a strategy for web surveying should take into consideration these behavioural patterns.

The web survey implementation took into consideration a framework proposed by Belfo and Dinis that provides an overall picture of main issues to be considered in a web survey implementation (see Figure 25). Building upon the research foundations consisting of goals, resources, timeline, and sampling procedures, the framework is structured into three phases: tool selection, questionnaire design and survey administration. The framework calls also into light concerns on how to deliver the survey regarding the respondent's computer expertise, graphical interface and data security (Belfo & Sousa, 2011c).

The first web survey implementation phase was the tool selection. Relevant selection criteria include language flexibility, workflow possibilities, real time options, available services, reporting capabilities, metadata features, design features, data extraction facilities, flexibility, ease of use, price and limitations. The WebSM site provides access to data regarding almost four hundred software tools for web surveys. Some of them are free of charge, others have free limited versions charging for extended versions and prices can go over $20.000. Some solutions may even be integrated with telephone (Centre for Methodology and Informatics, 2011). As it was already said, the Limesurvey was the selected tool. The reasons behind this selection will also be better explained further on.

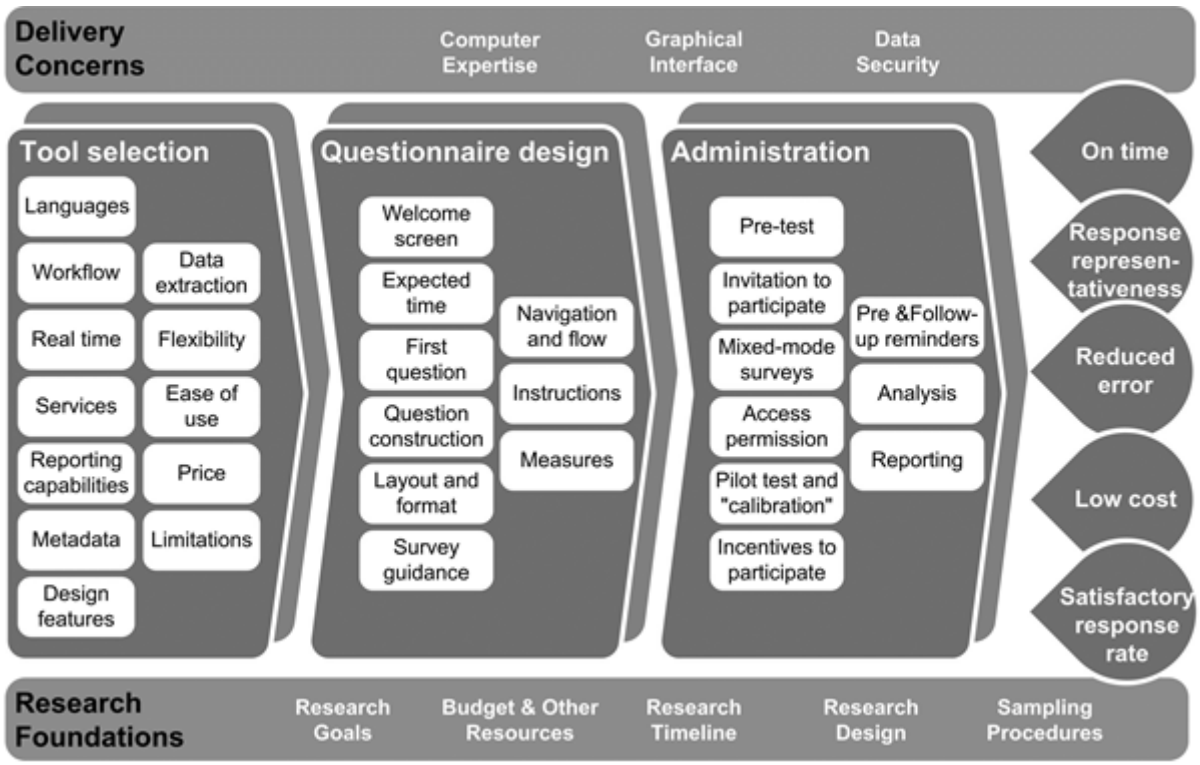


Figure 25: Web survey implementation framework
Source: Retrieved from Belfo & Sousa (2011c)

The second phase was the web questionnaire design. The web surveys have several specifics when compared to paper surveys. Some best design practices from a multidisciplinary approach have been considered to increase the effectiveness of this web survey (Laboratory for Automation Psychology at University of Maryland Institute for Advanced Computer Studies, 2011). They may be categorized by the following topics: welcome screen, expected time, first question, question construction, layout and format and instructions. For instance, the Limesurvey application allowed avoiding some of possible respondents' behaviours, respectively, item nonresponders, lurkers, lurking drop-outs and item non-responding drop-outs, through specific navigation and flow configuration. The last phase was the survey administration encompassing a set of initiatives to improve survey effectiveness, particularly focusing on the increase the validity and reliability of the survey, as well as on the respondents' participation (Solomon, 2001). The pretest of the web survey by a special invited group of people and the use of a pilot test were some of those initiatives. A special attention was given to follow-up reminders to participants, adequate incentives to participate and to the restrict access to the questionnaire, by managing individual tokens given at the invitation email (Gunn, 2002). The Limesurvey tool also easily provided some basic analysis and reporting for a better control of the survey

3.3 Structural equation modeling

(a) Introduction to SEM

The method of structural equation modeling (SEM) probably represents the most important and dominant statistical development in the social sciences in recent years. By combining features of first generation techniques, SEM is considered a second generation multivariate analysis technique (Hair, Ringle, & Sarstedt, 2012). SEM has become a quasi-standard in research, mostly suitable for the development and test of theories.

The number of researches on information systems field using techniques based on structural equation modeling (SEM) has considerably augmented. If properly applied, the procedures based on SEM have considerable benefits comparatively to first-generation techniques such as principal components analysis, factor analysis, discriminant analysis, or multiple regressions. This is due to a greater flexibility that a researcher has for the interaction between theory and data (Chin, 1998).

Researchers have selected SEM's techniques because it estimates the multiple and interrelated dependence in a single analysis. The SEM collects some statistical techniques, allowing the examination of relationships among multiple predictor and response variables (Vinodh & Joy, 2012).

According to Marôco, the structural equations analysis normally takes place according to a set of increasing complexity and recurrent successive steps (Marôco, 2010). This process may include revising the state of the art, theoretical model elaboration, data collection, model specification and identification, model estimation, model validation, model evaluation and model acceptance or rejection.

Next, this section will present the two statistical SEM methods (covariance-based SEM and partial least squares SEM), the graphical representation of SEM, the reflective and the formative measures approaches, the hierarchical component models, the approaches to estimate the higher-order constructs at hierarchical component models and the bootstrapping procedure used in PLS SEM path modeling.

(b) Covariance-based SEM and partial least squares SEM

There are basically two different statistical SEM methods: the covariance-based SEM (CB-SEM and the variance-based partial least squares (PLS) path modeling, also referred to as PLS-SEM. Different philosophies and estimation objectives exist at these two SEM approaches. While the CB-SEM is a confirmatory approach, focusing on the model's theoretically established relationships and trying to minimize the difference between the model-implied covariance matrix and the sample covariance matrix, the PLS-SEM is a prediction-oriented variance-based approach, seeking the maximization of the explained variance of the endogenous constructs of the model (i.e., their R^2 value) (Hair, Ringle, et al., 2012).

Although covariance-based SEM is the most widely applied method, the variance-based partial least squares SEM (PLS-SEM) approach is lately becoming an important alternative technique for SEM (Hair, Hult, Ringle, & Sarstedt, 2014). According to a review of the research published in MIS Quarterly journal, Ringle, Sarstedt and Straub, concluded that there were 65 studies containing 109 structural

equation model estimations and deploying the PLS-SEM technique in the 20-year period from 1992 through 2011. Having small sample sizes, non-normal data or formatively measured latent variables are the most important arguments pointed by the researchers of those 65 studies to support the usage of the PLS-SEM technique (24, 22 and 20 studies, respectively) (Christian M. Ringle, Sarstedt, & Straub, 2012).

Indeed, the PLS-SEM approach is good alternative to CB-SEM when the sample size is small, the applications have little available theory, the predictive accuracy is paramount or the correct model specification cannot be ensured (Wong, 2013).

The little available theory supporting the relation of incentive with alignment of business with the IT is an important argument for the usage of the PLS-SEM. Also, as the incentive construct was developed specifically for this study (the alignment construct was no so), the correct model specification cannot be ensured, and so, this reason also strengthens the use of PLS-SEM. Another usual argument to support the use of PLS at structural equation modeling is when there is a limited number of participants and the data distribution is skewed. At this study, where the unit of analysis is the company, the ideal situation would be to have a significant number of business and IT managers responding at each company. That could give an ample opinion and not a personal perspective of the incentive and alignment maturities on the company. Yet, although an effort was made to have several respondents at each company, a significant number of the analyzed companies had just one respondent. This can be a good reason to use the PLS-SEM approach.

(c) Graphical representation

Besides the mathematical formulation of a structural equations model, today it is normal represent the model in a graphical way. Indeed, most of SEM software allows the specification of the model graphically (Marôco, 2010).

Symbol	Meaning
□	Manifest or observed variable
○	Latent variable (factors or errors)
→	Causal relation (from cause to effect)
⇄	Recursive relation or *feedback*
↔	Correlational relation

Table 4. Used symbols and correspondent meanings of structured equation modeling
Source: Adapted from Marôco (2010)

By convention, the latent variables (using the Greek alphabet) are represented by circles or ellipses and the manifest variables (using the Roman alphabet) are represented by rectangles (see Table 4).

(d) Reflective or formative measures approaches

The type of relationship among a first-order latent variable and their manifest variables or a second-order latent variable and the first-order latent variables may be either reflective or formative (Becker, Klein, & Wetzels, 2012). The indicators that depend on a latent variable are also known as "affect indicators". On the contrary, when the dependency is on the opposite direction, the indicators are known as "cause indicators" or formative or composite indicators (Bollen & Lennox, 1991).

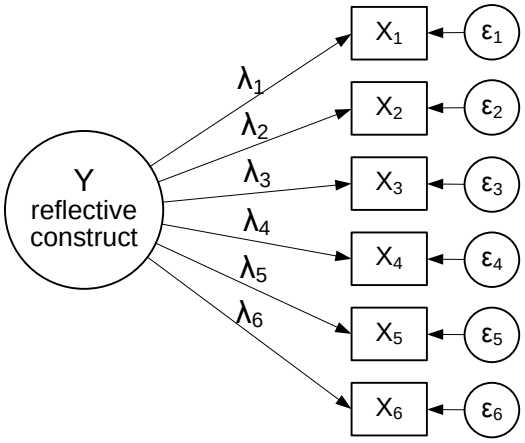


Figure 26**:** Reflective construct and corresponding manifest variables

If the relation is a reflective one, then, the construct is viewed as the cause and the measures or indicators its manifestations. When this is the case, the model, also called the molecular model (Karahanna, Straub, & Chervany, 1999), represents the causal relations between the construct and its indicators, by using an appropriate arrow from the construct to each indicator, as shown in Figure 26. A reflective construct (Y) may be represented as $X_i = \lambda_i Y + \varepsilon_i$, where X_i is the i^{th} indicator, Y is the reflective construct, λ_i is the coefficient which measures the expected effect of Y on the i^{th} indicator and ε_i is the measurement error for the i^{th} indicator (Roy, Tarafdar, Ragu-Nathan, & Erica, 2012).

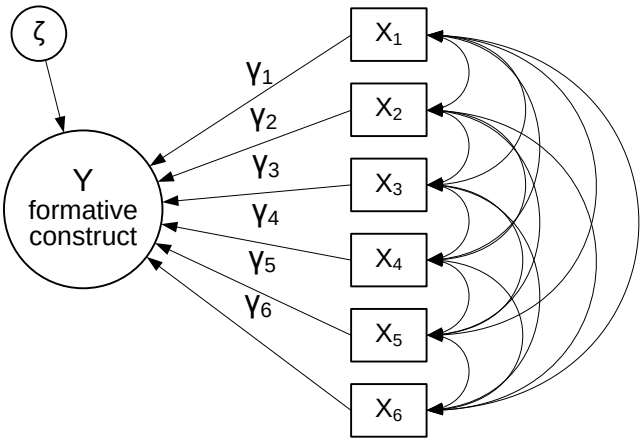


Figure 27**:** Formative construct and corresponding manifest variables

On the contrary, in a formative model, or molar model (Karahanna et al., 1999), the indicators determine or cause the construct, as it is shown at Figure 27. A reflective construct (Y) may be represented as $Y = \gamma_1 X_1 + \gamma_2 X_2 + \ldots + \gamma_n X_n + \xi$, where X_i is the i^{th} indicator, Y is the reflective

construct, γ_i is the weight associated with the i^{th} indicator and ζ is the common error term. Consequently, a formative construct is a summation of its indicators effects. Here, the only error term (random variance), represented as ζ, is associated with the construct as a whole and not with the individual indicators (Roy et al., 2012).

The "motivating potential" construct proposed by Hackman and Oldham is a good example of a formative construct. This construct is computed by combining the scores of jobs on five dimensions, respectively; skill variety, task identity, task significance, autonomy and feedback (Hackman & Oldham, 1976). Other examples are the "exposure to discrimination", which is indicated by race, sex, age, and disabilities, or the "life stress", which can be the latent variable and job loss, divorce, recent bodily injury, and death in family could be four causal indicators of it (Bollen & Lennox, 1991).

(e) Hierarchical component model

When the complexity of the constructs used in a research is high, as is the case of both incentive and alignment constructs used at this research, it is recommended the usage of higher levels of abstraction, operationalized through higher-order models, normally called, hierarchical component models (HCMs).

The HCM may contain several layers of constructs, although in the majority of the cases there are only two layers. It is constituted with at least one higher-order component (HOC), that captures a more abstract entity, and lower-order components (LOC), at least two, that capture the subdimensions of the more abstract entity and which relate with it in a formative or reflective way (Hair et al., 2014).

The Figure 28 presents the four types of hierarchical component models in PLS-SEM, respectively, the reflective –reflective, reflective-formative, formative–reflective and formative– formative types.

The review made by Ringle, Sarstedt and Straub that was previously mentioned, about the 65 PLS-SEM studies published from 1992 through 2011 in MIS Quarterly journal, revealed that 15 studies of those studies (23.08%) included 25 hierarchical component models. Of those, the great majority (13 of 25 models, 52%) were of reflective–formative type, precisely the same type adopted at this research (Christian M. Ringle et al., 2012).

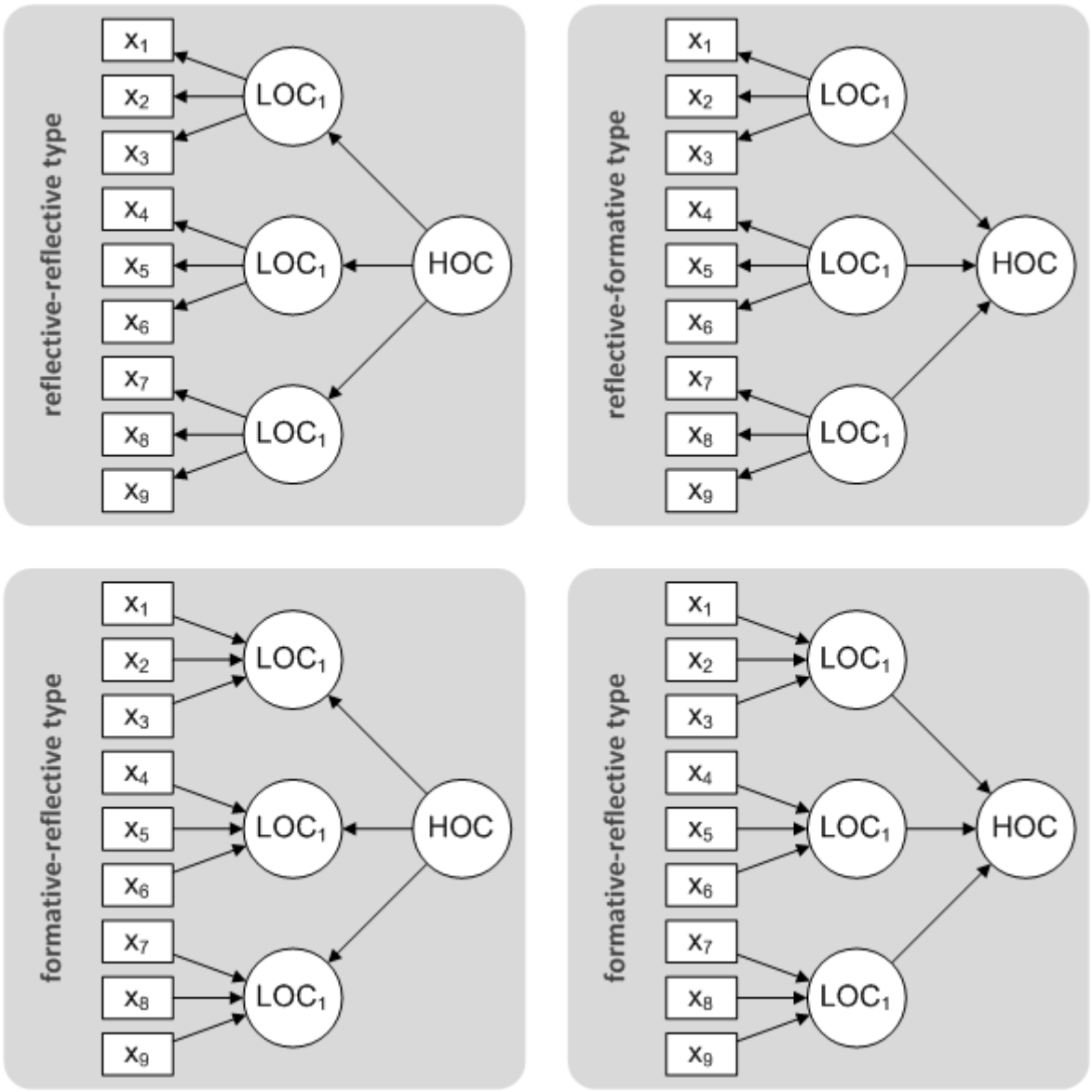


Figure 28: Types of hierarchical component models in PLS-SEM
Source: Adapted from Ringle et al. (2012)

The utilization of hierarchical component models in PLS-SEM is mainly due to three main reasons (Hair et al., 2014):

- They may help creating more simple and easier to understand PLS models
- Their second-order constructs can reduce collinearity, solving discriminant validity problems when constructs are highly correlated
- They prove valuable if formative indicators exhibit high levels of collinearity

(f) Estimation of hierarchical latent variable models

There are three approaches to estimate the higher-order constructs at hierarchical component models (HCMs). The first is the repeated indicator approach, the second is the sequential latent variable score method or two-stage approach and the third is the hybrid approach (Becker et al., 2012).

At the first approach, the repeated indicator approach, the higher-order variable uses all the indicators used by its first-order latent variables. As the indicators of the first-order latent variables are related not only with those variables but also the higher-order variable, this method is called the repeated indicator approach.

At the second approach, known as the sequential latent variable score method or two-stage approach, the model is estimated using two stages. At the first stage, the relations of the indicators with the first-order latent variables are established and the construct scores of those variables are estimated. Then, at the second stage, the relations between the first-order latent variables and the second-order variable are established, using the construct scores of the first-order variables as the indicators for the higher-order latent variable at this second stage estimation.

The hybrid approach is analogous to the repeated indicator approach. Yet, it uses each indicator only once, dividing all the indicators among the first-order and the second-order variables. Usually, half of the indicators are used at the first-order variables and the other half at the second-order variable.

(g) Bootstrapping procedure

The statistical testing of the coefficient of each model path is usually done through an analysis that is called bootstrapping. The bootstrapping is a nonparametric procedure, used in PLS SEM path modeling, to provide confidence intervals for all parameter estimates, estimating the shape, spread and bias of a specific statistic (Henseler, Ringle, & Sinkovics, 2009).

The bootstrapping procedure generates a big and pre-specified number of bootstrap samples (for example 5.000 samples). All bootstrap samples, created by randomly replacing cases from the original sample, should have an equal number of cases as the original sample (Hair et al., 2014).

The hypothesis that a specific outer weight w_i of a certain indicator *i* is in fact zero in the population is tested by the bootstrap method. A Student's test can be calculated to test whether w_i is significantly different from zero. The first hypothesis corresponds to $H_0: w_i = 0$ and the second hypothesis to $H_1: w_i \neq 0$. The Student's test is calculated as it is presented at Equation 2, where A $se^*_{w_i}$ is the boostrap standard error of w_i.

$$t = \frac{w_i}{se^*_{w_i}}$$

Equation 2: The Student's test formula

As a rule, when there are more than 30 observations, like the sample used at this research, the *t* distribution with a *df* degrees of freedom is well approximated by the normal (Gaussian) distribution. At these situations, hypothesis H_0 can be rejected and the path coefficient considered significant if the *t* value is above 1.65 at a significance level of 10% ($\alpha = 0.10$; two-tailed test), if the *t* value is above 1.96 at a significance level of 5% ($\alpha = 0.05$; two-tailed test) or if the *t* value is above 2.57 at a significance level of 1% ($\alpha = 0.01$; two-tailed test) (Hair et al., 2014).

3.4 Instrumentation

(a) Initial instrument development

The model uses two constructs: "incentive" and "alignment". As any other constructs, they are "a conceptual term used to describe a phenomenon of theoretical interest" (Edwards & Bagozzi, 2000). These constructs are latent variables or constructs, which mean that the phenomenon described by them may not be directly observable. When this happens, constructs are measured with the help of observed scores, which usually are known as measures, indicators, items or manifest variables[1]. According to best practices, this investigation used or adapted existing measuring scales for the research purpose when possible (Segars & Grover, 1999).

Before starting the development of the incentive instrument itself, the concern was having, in advance, a framework that could be sufficiently comprehensive. The adopted framework was the proposed by WorldatWork. The WorldatWork, an association representing professions comprising total rewards, proposed an exhaustive reward model composed by five dimensions which are Compensation, Benefits, Work-Life, Performance and Recognition, Development and Career Opportunities (WorldatWork, 2008). Although it is not an assessment instrument, this model helped to extensively structure motivational dimensions. The definition of the initial proposal of the instrument for assessing the incentive maturity was based on these dimensions and had three steps (Belfo & Sousa, 2011a). The first step was the analysis of several motivational assessment instruments. A significant literature review allowed the identification of a relevant set of motivation assessment instruments. After the analysis of these instruments, none of them was considered as completely fulfilling all the identified motivational dimensions. So, the second step was searching for eventual motivational specificities of IT staff beyond the more common motivational issues. This step is anchored on the idea that most measuring scales concerning incentive do not rely on these kinds of personnel specificities. Thirdly, by analysing the previous analysed instruments and new eventual relevant items, the items that should be part of the instrument were selected.

[1] In this thesis, the terms "measure", "indicator" and "item" will be used interchangeably.

Dimension	Variable	Scale Items	Source *
Compensation	Base Wages	I receive fair base wage for my job compared to others doing similar work at other companies	2
	Premium Pay	My company offers a generous premium increases in payment for on-call work or valued special skills	2
	Variable Pay	I am pleased because I'm earning more for what I do if I largely exceed the objectives	4
		I understand how my variable payment is determined	2
Benefits	Legally Required	I feel my company do not meet legal obligation benefits to each employee (R)	2
	Health & Welfare	My company's offers medical plans or other health or welfare benefits that meet my needs	2
	Retirement	I feel the retirement benefits offered by my company meet employees needs	2
	Pay for Time Not Worked	To me, it is very important the company payment for time not worked, like when I get sick or by other weighty reasons	8
Performance & Recognition	Performance	I understand the measures used to evaluate my objectives	1
		I regularly participate in the company's decision making and on the performance management system	2
	Job Assignment	I enjoy doing my activity very much.	6
		My skills are effectively used on the job	1
	Recognition	At my company, I am recognized for my accomplishments	1

* 1-HRSurvey; 2-HRSurvey adaptation; 3-WPI; 4-WPI adaptation; 5-Hsu et al.; 6-IMI adaptation; 7-UPWLQ adaptation; 8-New

Table 5. Scale items for compensation, benefits and performance/recognition dimensions
Source: Retrieved from Belfo & Sousa (2011a)

An extensive literature review allowed the identification of seven relevant set of motivation assessment instruments. These instruments were the General Causality Orientations Scale (Deci & Ryan, 1985a), the Work Preference Inventory (Amabile, Hill, Hennessey, & Tighe, 1994), the Harter's instrument (Harter, 1981), the Academic Motivation Scale (R.J. Vallerand, Pelletier, Blais, Briere, Senecal, & Vallieres, 1992; RJ Vallerand, Pelletier, Blais, Briere, Senecal, & Vallieres, 1993), the Human Resources Survey (HR-Survey, 2011) and the Work-Life Questionnaire (Wrzesniewski, McCauley, Rozin, & Schwartz, 1997) and the Intrinsic Motivation Inventory (McAuley, 1989). From the analysed instruments, over 200 items have been analyzed regarding the potential contribution for the instrument.

Dimension	Variable	Scale Items	Source *
Work-life	Workplace Flexibility / Altern. Work Arrangements	My current position permits me to experience the chance to do things my own way and not to be constrained by the rules of an organization	5
		I can arrange my work schedule to meet my personal and/or family needs	1
	Paid & Unpaid Time Off	It is difficult for me to get time off because of maternity/paternity or sabbatical reasons (R)	8
	Health and Wellness	It is important for me to have health or wellness initiatives and services, like on-site fitness facilities, that are offered by my company	8
	Community Involvement	I am proud to be working at my company because my work and my company makes the world a better place	7
		My current position permits me to experience a career in which I can be committed and devoted to an important cause	5
	Caring for Dependents	My company helps employees caring for their child and dependents	8
	Financial Support	My company offers financial support to meet my family needs, like education ones	8
	Voluntary Benefits	I don´t give so much importance to benefits offered like parking, employee discounts or car/home insurance (R)	8
	Cultural Environment	My company values team work and diversity	2
		Senior managers listen to me and care about my ideas	1
	Workplace Stability	My current position permits me to experience remaining in my area of expertise throughout my career	5
	Available Equip. & Data	My company provides me with the necessary data and technological resources to do my job well	2
Development & Career opportunities	Learning Opportunities	My work allows me with opportunities for increasing my knowledge and skills.	4
	Coaching / Mentoring	My supervisor is an effective role models for me	1
	Advancement Opportunities	My current position permits me to develop a career that permits to continue to pursue my own lifestyle	5
		My current position permits me to success by being constantly challenged by a tough problem or a competitive situation	5

* 1-HRSurvey; 2-HRSurvey adaptation; 3-WPI; 4-WPI adaptation; 5-Hsu et al.; 6-IMI adaptation; 7-UPWLQ adaptation; 8-New

Table 6. Scale items for work-life, development and career opportunities dimensions
Source: Retrieved from Belfo & Sousa (2011a)

Taking the five dimensions from the reward model (WorldatWork, 2008) to structure variables regarding either general or IT specific motivators, Table 5 and Table 6 present the resulting initial instrument comprising 30 items across 23 variables. Some of the 30 items come directly from one of the analyzed instruments, others have been adapted and some are new.

The instrument for measuring the alignment construct was based on the one proposed by Luftman (2003). This instrument was the one adopted not only because it is one of the most relevant

instruments concerning the alignment in the literature, but because it also seems sufficiently embracing and promising. However, before adopting the Luftman's instrument as the basis for this study, the most relevant assessment approaches in the literature concerning the alignment domain were identified and analysed. This analysis was done under the lenses provided by the Luftman's alignment measurement instrument (Belfo & Sousa, 2012). It embraced a search for important references using the Google Scholar engine and an initial set of keywords related to the subject as "business", "information", "technology" and "alignment". The results coming from from the previous searches were checked against the survey instruments identified in two specific repositories, respectively the Calgary Surveys Query System (CSQS) and the "Survey Instruments in IS" (Newsted, Huff, Munro, & Schwarz, 2012). Finally, six other instruments (Chan et al., 1997; Cragg et al., 2002; Kearns & Lederer, 2003; Reich & Benbasat, 2000; Sabherwal & Chan, 2001; Segars & Grover, 1999) were selected as the most popular, based on the number of citations in Google Scholar and were confronted with Luftman's instrument. The Table 7 summarizes the analysis of selected instruments on each dimension of Luftman's instrument. For each instrument, the degree of coverage of the six dimensions was measured using a five point scale: 1 as "not covered"; 2 as "weakly covered"; 3 as "moderately covered"; 4 as "well covered" and 5 as "strongly covered".

Instrument	Year	Dimensions					
		Communications	Competency/Value Measurements	Governance	Partnership	Technology Scope	Skills
Luftman	**2003**	**5**	**5**	**5**	**5**	**4**	**5**
Chan, Huff, Barclay & Copeland	1997	1	1	4	1	4	1
Reich & Benbasat	2000	4	2	3	2	1	1
Sabherwal & Chan	2001	1	1	4	1	4	1
Kearns & Lederer	2003	3	1	4	3	2	1
Segars & Groover	1999	2	2	4	2	1	1
Cragg, King & Hussin	2002	1	1	4	1	4	1

Table 7. Degree of coverage of Luftman's dimensions by alignment instruments
Source: Retrieved from Belfo & Sousa (2012)

The analysis of the degree of coverage of each dimension of the different instruments under the lenses of the Luftman's instrument is somehow subjective. The classification that was made for the communications dimension coverage of each instrument revealed that, besides a strong coverage by Luftman's instrument, it was well covered by Reich & Benbasat (2000) instrument and moderately covered by Kearns & Lederer (2003) instrument. Governance was the dimension better covered by all instruments. The second best covered dimension was the technology scope. Luftman's approach may improve this dimension by evaluating the direct contribution of systems to business objectives. Apart from Luftman (2003) approach, the other analyzed instruments do not consider the skills dimension. Partnership and competency/value measurements dimensions were poorly covered in the other

instruments. In short, Luftman's instrument, comprised of six dimensions and 38 items, takes into account a considerable number of facets. However, it is hardly difficult if not impossible to capture all the facets for complex constructs. Nevertheless, Luftman's instrument seems to provide a strong coverage of important dimensions except for the technology scope. For that reason and also because the adoption of an existing measuring scale facilitates future comparison of new findings with those of past studies, the Luftman instrument was adopted.

The method used to measure all the indicators was the Likert scale. As it will be better explained ahead, the Likert scale may be used to measure attitudes concerning any subject varying along a negative-to-positive dimension, usually varying from strong disagreement to a strong agreement. This method will be used at the incentive domain. Another characteristic of the Likert method is that it allows embracing diverse phrasing to the same item, where each phrasing corresponds to one possible response and is associated to a measurement on the negative-to-positive scale. This method will be used at the alignment domain.

(b) Likert method

Rensis Likert was an American psychologist that proposed a method of attitude measurement at his doctoral thesis and later, with an article with a shortened version, in 1932 in the Archives of Psychology. His innovative proposal, contrary to the idea of his contemporary colleagues, which believed that their work should be just confined to the study of observable behaviour, rejected that idea and supported that unobservable (or "latent") phenomena like attitudes could be measured (Johns, 2010).

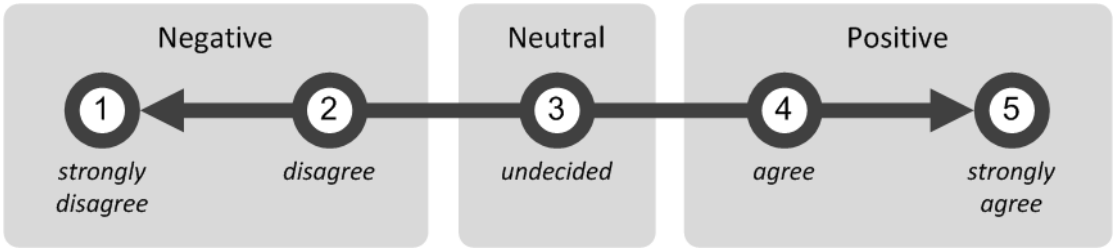


Figure 29: Example of attitude measurement options on Likert method

According to Likert, the attitudes concerning anything or on any issue vary along a negative-to-positive dimension. For instance, this dimension may vary from a very negative position, usually a strong disagreement, quantified with the lower possible value of the scale (1), into a very positive position, usually a strong agreement, the higher possible value of the scale (5). Figure 29 shows possible positions of a respondent on a survey about a certain survey item.

One characteristic of Likert's method is its universal application, enabling the measure of opinions as different as evolution or the existence of God. Another characteristic is that it is possible to adopt different wording to the same item, since it is guaranteed that response options covered the negative-to-positive dimension. A third characteristic, is that responses may be assigned to the same numerical codes and so, several items around the same subject may be jointly numerically analyzed (Johns, 2010).

Although each item of a questionnaire has a rating scale, a Likert scale has a different meaning. It is a psychometric scale where several items are used to capture the level of agreement or disagreement that a respondent has about an underlying phenomenon which is being investigated.

The design of each Likert items includes first, the writing of the item statement itself and second, the definition of the response options available to the respondents. And, some rules should be attended when designing Likert items. One best practice about writing Likert statements states that questions should not contain two attitude objects. The usage of a "double-barrelled" question may cause confusion, like, for example, asking about “how much do you agree or disagree that ... cannabis is a cause of crime and violence?”. Respondents may potentially answer about two different attitudes: that cannabis leads to crime, but, at the same time, they also may think that it not lead to violence (Johns, 2010). A second rule that should be followed when designing Likert statements is that questions should avoid quantitative statements. According to this rule, adverbs like “always” or “better” should be avoided, because they cause problems by introducing ambiguity into discordant responses. The third rule says that questionnaire designers are urged to ask questions from a neutral standpoint, avoiding lead the respondents towards a particular response (leading questions) (Johns, 2010).

(c) Incentive construct

The incentive construct was composed by five dimensions (compensation, benefits, performance and recognition, work-life, development and career opportunities). The Table 8 lists each one of these dimensions (variables) and the corresponding initial items that were proposed to measure each dimension.

Research Construct	Survey Item Number	Measure Description
Compensation (CMP)	I01	Base Wages
	I02	Premium Pay
	I03	Variable Pay
Benefits (BNF)	I04	Legally Required
	I05	Health & Welfare
	I06	Retirement
Performance and Recognition (P&R)	I07	Performance
	I08	Performance
	I09	Job Assignment
	I10	Job Assignment
	I11	Recognition
Work-Life (WKL))	I12	Workplace Flexibility / Alternative Work Arrangements
	I13	Workplace Flexibility / Alternative Work Arrangements
	I14	Paid & Unpaid Time Off
	I15	Health and Wellness
	I16	Community Involvement
	I17	Community Involvement
	I18	Caring for Dependents
	I19	Financial Support
	I20	Voluntary Benefits
	I21	Cultural Environment
	I22	Cultural Environment
	I23	Workplace Stability
	I24	Available Equipment & Data
Development & Career opportunities (D&C))	I25	Learning Opportunities
	I26	Coaching / Mentoring
	I27	Advancement Opportunities
	I28	Advancement Opportunities

Table 8. Constructs and correspondent initial items concerning the incentive

The Appendix 2 presents the complete questionnaire with each item description and respective options used at the pretest phase. The rationale behind each one these items will be better explained below.

(c.i) Compensation

According to the Total Rewards Model previously presented, compensation is a payment provided by an employer to an employee for services rendered (i.e., time, effort and skill). It comprises fixed pay, variable pay, short-term incentive pay and long-term incentive pay (WorldatWork, 2008). Appendix 7 presents the detailed list of compensation possibilities proposed by the Total Rewards Model. A recent research published by Ernst & Young, among 9,699 adults aged 18–67, full-time employed and across a variety of companies in the US, U.K., India, Japan, China, Germany, Mexico and Brazil, revealed that compensation justifies is the most important reason a full-time worker quit a job (Twaronite & Poll, 2015). The compensation represents an incentive so important to an employee that more than three quarters of the workers (76%) considered the compensation one reason to quit.

The compensation dimension has different facets. In Portugal, main legislation about compensation is compiled under the labor code, approved by Law 7/2009 from 12 of February and updated by successive subsequent legislative amendments (2012). The salary or wage, a form of periodic payment from an employer to an employee, is probably, the most important hygiene factor of incentive, according to the Herzberg's motivation-hygiene theory (Eisenhardt, 1989).

Compensation is composed by the base wage, and, at the firm operational level, sometimes almost or exclusively composed by it. Yet, employees at the strategic level of the organization, like the board members, chiefs, or even other managers or technical jobs at tactical level, usually have other important regular and periodic, direct or indirect, payments, in cash or in kind. In Portuguese legislation, these other regular and periodic payments, regulated by article number 258 of the labor code (Código do Trabalho, 2012), are also considered part of the employee salary. Item I01 will try to capture this first property of the compensation construct.

Another type of compensation is justified when workers in their respective jobs, have more demanding working conditions in the exercise of their functions. These situations may be unusual and temporary; in particular those resulting from work overtime, night work, work at weekly rest days, work at supplementary holidays or working outside the normal place of work. They may also be permanent, namely those resulting from doing risky, painful or special work, but, just while endure working conditions that determined the work. In Portuguese legislation, these compensation is called supplementary compensation and is regulated by articles number 227 to 231 of the labor code (Código do Trabalho, 2012). Nevertheless, if these payments are beforehand guaranteed, and, if they are clearly important, regular and permanent, then they must be considered as integrating the employee salary and cannot be considered supplementary compensation (Reis, Pereira, Reis, & Ravara, 2013). This property will attempt to be captured through the item I02.

Another possible facet about compensation is that employees may earn more if they meet or exceed their objectives. The variable part of the remuneration includes forms of short-term compensation, like commissions or participation in profits and results, as well as long-term compensation as executive bonuses (Russo, Viana, & Hall, 2007).

By looking at the Portuguese reality, besides the salary, there are other types of payments that may be due to rewarding employees about the good results obtained. Yet, the concept of salary may,

or may not include these kinds of payments. If payments made to the employee are related to the results obtained by the company when, either because of their respective conferring title, or because of they are regular and permanent rewards, they have a stable nature, regardless of the variability of its amount, then, they are considered part of the salary (Ramalho, 2013). Anyway, bonuses or monetary awards that are normally the consequence of applying the company's results to try to reward good performance may represent an important incentive. Usually, they are typically previous and periodically negotiated with the employee, before the year begins and, considering several conditions and rules. These kinds of incentives are normally based on "quota-based" programs, but may include more than one scheme. Quota-based incentives are part of motivational programs that rewards everyone who achieves the company's objectives. These programs, first, should carefully define fair and accurate individual quotas, adequately aligned with business objectives. For instance, for salesmen, quotas can be sales amount targets. Then, if the quota is achieved in a given performance period, an extra payment is given to the employee. It is common to define an extra monthly salary payment as the incentive to those who reach the previously defined quota. Some firms also set that employees with a performance above 100 percent earn more than the target incentive and those below may earn a part of the target incentive. As the success of an employee working in a firm using a quota-based program is primarily measure by the performance against his quota, then, failure to reach the quota shows he isn't doing his job well and may lead to unmotivated employees. Yet, the opposite is also true (Albrecht, 2010).

Quota-based bonuses programs seems to really enhance productivity, not only to the employees with best performers, but also to the weaker performers (Chung, Steenburgh, & Sudhir, 2014). Comparing to other popular types of tangible incentive programs, like the "piece-rate" incentive programs (for increasing rates of performance - doing more of something), the "tournament" programs (where individuals and/or teams compete with each other for incentives) or the "fixed-rate" incentives (salary-based compensation, typically associated with a scheme that pays predetermined amounts of money per unit produced), the "quota-based" incentive programs seem to be the most effective (Stolovitch et al., 2002). The reason why, apparently, "quota-based" incentive programs work best is that they increase the person's perception of control – allowing employees to decide for them to overcome the performance goal. A variable component of compensation, dependent on the definition of objectives and performance appraisal, may be very complex and may include several different parts (WorldatWork, 2008). For example, it may consider short or long-term payment incentives, including stock options (Lerner & Wulf, 2007), or it may be alternate between "pay-to-performance" and what might be called "pay-to-effort" measures of incentive strength (Baker & Hall, 1998). In Portugal, these type of payments are excluded from the retribution concept and are regulated under the article number 260 of the labor code (Código do Trabalho, 2012). This property of the compensation construct will try to be captured by item I03.

(c.ii) Benefits

According to the Total Rewards Model, benefits are programs used to supplement the cash compensation that employees receive, usually designed to protect the employee and his or her family from financial risks and can be categorized into legally required/mandated, health and welfare, retirement and payment for time not worked (WorldatWork, 2008). The term perks, also called fringe

benefits, is also used to designate these various types of non-wage compensation provided to employees in addition to their normal wages or salaries. They may embrace legally required or mandated benefits, like a worker's compensation insurance or social security insurance; health and welfare benefits, like a dental plan or a life insurance; retirement benefits, like a defined benefit plan; or pay for time not worked benefits, like holiday or sick leave payment. In practice, benefits are "a form of remuneration offered by the employer not strictly connected to the employee's individual tasks" and they can be regulated on different levels: national, collective, company and/or individual level (Janssen et al., 2007). Appendix 7 presents the detailed list of benefits proposed by the Total Rewards Model.

In practice, the term "employee benefits" is used in a way that sometimes differs from situation to situation, causing some confusion. For example, some authors consider the benefits concept in a too embracing logic, including incentives like job resources facilities, time flexibility, child care support or workplace policies as part of the benefits package of an employee (Idealist Careers, 2015). Others authors, use a more restrictive definition of benefits, essentially viewed as a form of remuneration supplement (WorldatWork, 2008). Independently of what could be the best concept of benefit, what it is really important is to adopt a clear concept. The benefit concept that is used here is the one generically proposed by the Total Rewards Model. So, for the purpose of this study, the "employee benefits" concept will basically be the one used by the Total Rewards Model, only including programs used to supplement the cash compensation. This approach will only consider the incentives that are insurances or any other aid, likely to be directly converted into money. Consequently, in order to be coherent with this definition, a small number of incentives proposed by the Total Rewards Model (see the in Appendix 7), included at the voluntary benefits category, like auto/home insurance, pet insurance, legal insurance or identity theft insurance that are classified as work-life incentives, should also be consider as benefits because they can easily be converted into money and are clearly supplements of the cash compensation.

The employee benefits may include other type of benefits, typically oriented to white-collars employees, usually called non-cash fringe benefits (Janssen et al., 2007). These may comprise the provision of a company car, the offer of the corresponding needed fuel, mobile phone, laptop, a pack of communication facilities, housing, either provided or paid by the employer, electricity, water, athletic facility memberships, tickets to sporting or cultural events, gift cards, or different kind of vouchers like food stamps. Usually, these are considered as benefits if they have a private usage, far beyond the professional usage. The Total Rewards Model doesn't explicitly mention this non-wage benefits category. Yet, according to some studies (Janssen et al., 2007; Scott, Currie, & Tivendale, 2012), these benefits are important and deserve to be valued.

Because fringe benefits are forms of compensation provided to employees outside of a stated wage or salary. Some countries, like Portugal, usually tax the part of the benefit, like the meal allowance, that exceeds a certain maximum diary value. Nevertheless, taxation policies of the fringe benefits in Portugal, and in other countries, normally encourage employers to offer these benefits, since as untaxed benefits, they are worth more to employees than their cash wage value (Scott et al., 2012). Sometimes, employee benefits are used as discretionary benefits, only given to some special employees, in order to distinguish them because of their importance in the organization or their

seniority. In practice, employee benefits or fringe benefits are also part of what is usually called the "salary package".

Some important benefits, like those related to social insurance, are compulsory, properly regulated by each country. The scope of the National Academy of Social Insurance (NASI), a nonprofit, nonpartisan organization made up by leading experts on social insurance of the United States of America, is to cover social insurance, such as social security, Medicare, workers' compensation, and unemployment insurance, related public assistance, and private employee benefits. According to a research report from NASI, the workers' compensation programs, almost exclusively financed by the employers, differ across the states of USA in terms of who is allowed to provide insurance, which injuries or illnesses are compensable, and the level of benefits provided (Sengupta, Reno, Burton Jr, & Baldwin, 2012). In the USA, compensation of work-related injuries/illness are typically paid by insurances purchased by employers or through self-insured employers benefits, with the private insurance carriers being the largest source of workers' compensation benefits in 2011, with 54% of the paid benefits. Also, unemployment protection is covered by a Unemployment Insurance (UI), a federal/state program that provides cash benefits to workers who become unemployed through no fault of their own and who meet certain eligibility criteria set by the each state (Sengupta, Baldwin, & Reno, 2013).

In Portugal, workers' compensation is also normally paid through the employers. In Portugal, the unemployment protection benefit is guaranteed by the employer's deduction to the social security global fund. Contrary to the USA, where employers have more insurance possibilities relatively to compensation benefits of work-related injuries or illness, like purchasing a state insurance fund, or self-insurance when large employers, in Portugal, the rule is to have employers purchasing workers' compensation insurance from private insurers. The normal regime in Portugal about unemployment protection benefits is the one obliged by the state, where fixed wage percentages are sent to social security, with correspondent predefined benefits defined by the government. Other extra coverage about unemployment protection beyond the standard is not common. As a response to the recent financial and economic crisis in Portugal, some banking groups sell insurances that normally cover monthly payments relatively to a house loan, in the event of involuntary unemployment for workers on behalf of others, which extends for a period exceeding 30 consecutive days (CGD, 2015). Yet, these insurances are purchased by the employee and not by the employer.

About compensation benefits of work-related injuries or illness, the rule in Portugal is that each company purchases an insurance to cover these risks. The mandatory insurance package is regulated by Law Nr. 98/2009 of 4 September (Lei 98/2009, 2009), which regulates the protection system of work-related injuries or illness, including rehabilitation and professional reintegration, in accordance with Article 284 of the Labor Code, approved by Law nr. 7/2009 of 12 February (Código do Trabalho, 2012). It regulates the right to compensation benefits which may be of medical kind, as any medical services, surgical, pharmaceutical, hospital and any similar other, whatever their form, provided that are necessary and appropriate to restore health or to earn working capacity of the victim and his recovery to working life, or of cash kind, as indemnities, pensions, installments and allowances prescribed by this law. Most standard insurance proposals of work-related injuries or illness risks in Portugal made by insurance companies only cover the obligation package regulated by Law Nr.

98/2009 of 4 September. Yet, besides the possible negotiation of personalized contracts, there are some insurance public proposals that cover some other options besides the risks considered on the minimum legal pack, like a set of supplementary risk coverages when the employee travels abroad (Açoreana, 2012). Initially, the item I04 tried to capture the property around the legal benefits that companies are obliged to make. Yet, as it will be better justified ahead, this approach was abandoned and only the non-compulsory benefits were considered at the instrument.

As it was presented, the possibilities list of employee benefits may be long. In order to evaluate the most important properties of the employee benefits' construct, it would be useful to know the most important benefits of employees. The USA's Office of Personnel Management (OPM), an Executive Branch agency charged with the responsibility for setting policy for the Federal Government's employees, designed and implemented a survey since 2004, named the Federal Employee Benefits Survey (FEBS), with the objective to measure the importance, adequacy, perceived value, and competitiveness of the benefits available to Federal employees (OPM, 2014). The 2013 survey revealed that the most important benefits program, according to the evaluation of the employees, was the retirement savings and investment plan, with 84.6% of the respondents saying that this benefit was extremely important. The second and third most important benefits for federal employees were the health benefits program and the retiree health benefits, with 83.0% and 79.1% of the respondents considering those benefits extremely important, respectively. Although limited to the available benefits options of Federal employees, this survey reveals the importance of these three benefits in a list of thirteen benefits programs, according to the opinion of those employees. Yet, other important benefits, as non-cash benefits, which are more popular in private companies than in public ones, should also be considered. For instance, a recent study reveals that company cars may represent approximately half of the new cars sold in some occidental countries like the USA (Scott et al., 2012). Although they represent 10% to 15% of the total fleet, this lower proportion is the consequence of, after a few years, they are normally sold as used, sometimes to the same employee that benefited from it during the first years.

Again, in order to possibly adapt the instrument to the Portuguese reality, a research was made about some of the available known options in the market specifically oriented to some employee benefits. Company cars may be contracted by the company through several common options, like leasing, long term rentals, renting, and bank credit. Although there can be tax differences among them, from the employee point of view, the important aspect is the possibility to benefit from it. The item I04 will try to capture the company car benefit.

As it was already said, the health benefits programs are among the most valued benefits by the north American employees (OPM, 2014). In Portugal, although the primary health system seems to assure an high quality of care, the health costs continue to climb and there are still some concerns regarding public health, like the poor capacity in the community to provide rehabilitative or other non-acute care services to patients upon discharge from hospital (OECD, 2015b). These and other concerns may place the health benefits as a type of incentives that are increasingly valued by employees in Portugal. Several Portuguese companies offer insurances covering a set of health risks, varying from some basic options to protections more complex and with higher maximum values of

coverages. One of these examples is the one proposed by AXA Portugal (AXA, 2014). This property of the benefits construct will attempt to be captured through the item I05.

The Federal Employee Benefits Survey (FEBS) also revealed that the retirement programs were among the most valued benefits by the north American employees (OPM, 2014). Although Portugal differs from the USA, with Portugal, unlike the USA, having a unique regime of public retirement benefits, the fact is that the retirement benefits are being sucessively decreased in Portugal and the perspective is that they may reduce even more in the future. So, this indicator still may be worthy to be included. A retirement saving plan is a typical kind of these benefits. In Portugal, there are several retirement savings plans are now available in Portugal, like the retirement plans "PPR – Adesão Empresas", proposed by Montepio Geral bank (Montepio Geral, 2015). These insurance options are specifically oriented to be totally paid by employers, but they also have the possibility of being partially or totally paid by the employees. The item I06 will try to capture this property.

There are other types of possible benefits. Another example of a popular pack of fringe benefits offered in Portugal is the one proposed by the company "Ticket Restaurant® de Portugal, S.A.", which has several options based on the use of vouchers or card. This company proposes several benefits alternatives, easily managed, having in mind the motivation, loyalty and increased productivity of its employees, like the "Ticket Restaurant", a payment method that allows organizations to subsidize, with tax advantages, daily meals of its employees, the "Ticket Infância", assigned to subsidize the education expenses of employee's children in Preschool (up to 7 years), the " Ticket Educação", a award of companies and institutions to their employees with children or equivalent, aged 7 to 25, to subsidize the payment of schools, and other education services, and expenses with manuals and textbooks, the " Ticket Care", a welfare worth assigned to support the employees and their families with the costs of social support services, including the admission to nursing homes, day centers, home care, physical therapy and other health costs, or the "ticket Car", a service ticket used for the payment of fuel and car care expenses (Ticket, 2015).

(c.iii) Performance and Recognition

The individual job performance is usually one of the most important concepts when an incentive policy is discussed. As other constructs in industrial/organizational psychology, job performance is a complex one. Many authors have studied innumerous aspects behind goal setting and individual performance management in the past (Alderfer, 1969; Banker et al., 2013; Banker et al., 2000; Barrick, Mount, & Strauss, 1993; John E Core et al., 1999; John Core et al., 2003; DCIPS, 2009; DeHoratius & Raman, 2007; Grogan, Geard, & Stephens, 2015; Hakala, 2008; Indjejikian, 1999; Ittner & Larcker, 2003; Locke & Latham, 2002; Locke, Shaw, Saari, & Latham, 1981; Orvill & Hicks, 2000; Rynes, Brown, & Colbert, 2002; Viswesvaran, 2001). With regard to individual job performance definition, although the difference between behaviours and outcomes is not clear-cut, I used the definition of individual job performance as evaluable behaviours (Viswesvaran, 2001).

The number of the issues concerning performance is also extensive and may include, among others, output, quality, quantity, lost time, turnover, training time, promotability, satisfaction, cost-effectiveness, need for supervision, interpersonal impact, job-specific task proficiency, nonjob-specific task proficiency, written and oral communication, demonstrating effort, maintaining personal discipline,

facilitating peer or team performance (Viswesvaran, 2001). However, some of these dimensions may not be very relevant to all job activities. The writing of effective performance objectives is difficult and a checklist may help to provide criteria to help evaluate the effectiveness of defined performance objectives. For instance, one important criteria is to guarantee that performance objective clearly depends to the strategic goals or objectives of the organization (DCIPS, 2009).

One of the first and most important issues about performance regards the need that the employee understand the measures used to evaluate his/her objectives. This facet of performance will tried to be measured by the item I07. This item was selected from an interesting embracing employee's attitude assessment named the Employee Attitude Survey (EAS), developed by Human Resources Survey (Belfo & Sousa, 2011a; HR-Survey, 2011).

Another incentive that is usually associated with the performance dimension is the employee participation in decision making. The research suggests that an employee with a greater participation in making decisions may perform better perhaps because it gives the employee a stronger feeling of ownership (Gerhart, Minkoff, & Olsen, 1995). Also, the lack of participation may make it easier for employees , but especially for managers to conceive ways the structure might have been rearranged if they were in charge or have been involved in decision making (Milkovich et al., 2011). The item I08 will try measure the degree of participation of the respondent in decision making.

Closely linked to job performance it comes the recognition. According to Worldatwork, the recognition consists on the acknowledgement or giving special attention to the efforts or positive performance of the employees (WorldatWork, 2008). Indeed, it can be seen as the answer to one basic needs in the Maslow's Hierarchy; the Esteem (Maslow, 1943).

To enjoy doing what an employee is doing in an organization may be due to several things. Indeed, the esteem is often used as a reward. According to Maslow, although money is valuable, beyond a certain level, many people are not strongly motivated by cash incentives (Maslow, 1943). Then, the esteem may work better and may be directly related to enjoy that someone has in doing something. The I09 item will try to capture the enjoying of doing something.

The normal rules for determining the relative value of work should consider several factors. Another factor that should be taken into consideration regards to the skills required to perform a certain job (Milkovich et al., 2011). If an employee has not the right skills to do a certain job, he/she will probably fail the desired objectives. Also, if someone is too much skilled to a certain job, probably that employee is overly payed comparatively to the activities he/she is responsible for. This aspect will be tried to be measured by item I10.

An incentive strategy definition should meet the intrinsic psychological need for appreciation and should strengthen certain behaviours that promote the organizational success. The recognition may be operationalized through cash or non-cash awards (like verbal recognition, trophies, certificates, plaques, dinners or tickets). The types of recognition are huge, like service awards, retirement awards, peer recognition awards, spot awards, managerial recognition programs, organization-wide recognition programs, exceeding performance awards, employee of the month/year awards, appreciation dinners, outings, formal events, goal-specific awards (quality, cost-savings, productivity, and safety) or employee

suggestion programs (WorldatWork, 2008). The item I11 will try to directly measure the recognition practices.

(c.iv) Work-Life

The definition of a suitable balance between the "work" (career and ambition) and the "lifestyle" (health, pleasure, leisure, family or spiritual development), or simply the relationship between working and non-working life, usually called as work-life balance, has been a concern of a significant number of researchers (Alterman, Luckhaupt, Dahlhamer, Ward, & Calvert, 2013; Amabile et al., 1994; Robert Anderson, Mikuliç, Vermeylen, Lyly-Yrjanainen, & Zigante, 2009; Belfo, 2011; Belfo & Sousa, 2011a, 2011b; Gupta & Tayal, 2013; Hackman & Oldham, 1976; Hart & Ma, 2010; Herzberg, 1964; Herzberg et al., John Wiley & Sons, Inc./1959; Sangheon Lee, McCann, & Messenger, 2007; Owens & Khazanchi, 2011).

The work-life importance is a recognized dimension of general quality of life. The Organisation for Economic Co-operation and Development (OECD) created an index called Better Life Index that allows the comparision of well-being across countries, based on 11 topics identified as essential, in the areas of material living conditions and quality of life. The work-life is precisely one of these topics. For OECD, the key issue is to find a suitable balance between work and daily living. As the evidence seems to suggest, long work hours may damage personal health, jeopardise safety and growth stress. Also, the overall well-being depends on the amount and quality of leisure time which can bring additional physical and mental health benefits. Consequently, OECD proposes two indicators relatively to work-life. The first is an indicator measuring the proportion of dependent employed whose usual hours of work per week are 50 hours or more. The second indicator measures the amount of minutes (or hours) per day that, on average, full-time employed people spend on leisure and on personal care activities. At the edition of 2015, Portugal presented 9,62% of the dependent employees, whose usual hours of work per week are 50 hours or more, a lower value than the average of OECD which is approximately 13%. Also, Portuguese employees spend 14,95 hours on leisure and on personal care activities per week, a similar average of a full-time OCDE worker, with 15 hours (62% of the day) (OECD, 2015c).

Yet, according to WorldatWork, the work-life should also consider other complementary aspects. It consists in a specific set of organizational practices, policies, programs, combined with a philosophy which actively supports efforts to help employees achieve success either at work or at home, like workplace flexibility, paid and unpaid time off, health and well-being, caring for dependents, financial support, community involvement or management involvement/culture change interventions (WorldatWork, 2008). This holistic perspective is the one that will be adopted at this study.

The research published by Ernst & Young previously cited, revealed that one third of full-time workers say that managing work-life has become more difficult in the last five years. This is especially evident for younger generations (35% of the millennials and 34% of the respondents of X generation), women and for those who are parents (equally with 35% of the respondents, respectively) (Twaronite & Poll, 2015). One probable motive that makes managing work-life more difficult is to work long hours inside the office. Indeed, the same research revealed that another reason to quit job, ranked on the top five (with 71% of the respondents), is to have an excessive overtime hours. This is particularly obvious

on Germany and Japan, where this reason represents the most important reason to quit (75% and 73%, respectively).

One important aspect relatively to work-life is the workplace flexibility (or alternative work arrangements). It may comprise the possibility to work how, where and when makes the best sense for the employee, the business or the customers. The most common type of workplace flexibility is relative to the working schedule flexibility, usually comprehending the possibility to compress the work weeks or defining flexible daily hours (flextime). Other possibilities of flexible working may also comprise telework (flexplace), the usage of time banks or part-time work (Allen, 2001). There are also other alternative work arrangements where the flexibility is focused on what the employee should do. Some of these possibilities are the job sharing, referring to when two employees fill one full time position, the multiple concurrent jobs, referring to an employee who is working at two part-time positions or the employee having some freedom to define the work that he will do. This last possibility seems to be particularly appreciated by professionals at the IT area (Belfo & Sousa, 2011d). The fact that not having flexibility at workplace is considered as one of the top five reasons to quit a job proves its importance. More than two thirds of the workers (69%) which responded to the above mentioned survey said they resigned because their boss did not allow them to work flexibly (Twaronite & Poll, 2015). It is also interesting to note that if we compare the benefits associated with flexible work arrangements (e.g., flexible work hours or compressed work weeks) and benefits associated with the dependent care supports (DCS), the first is more important to an employee perception of a family-supportive organization than the second incentive (Allen, 2001). The items I12 and I13 will try to capture some facets of work flexibly.

The importance of getting a good balance between the work and the family/personal needs is also revealed by the same study, when it shows the sacrifices that employees are available to make to manage both these two responsibilities. Among those sacrifices, the job and the career changes are the most usual sacrifices that workers have made, or would be prepared to make, respectively with 63% and 57% of the respondents (Twaronite & Poll, 2015). Other significant sacrifices may be moving their family to another location, giving up an opportunity for promotion, moving to be closer to family or reducing working hours. Besides the work flexibility, the possibility to get a time off, either paid or not paid, can be very important to be able to manage work and family responsibilities. The item I14 will try to capture this feature.

The health and wellness initiatives in the workplace have proved as very important not only from the employee side, but also from the company perspective. Some studies found that medical or absenteeism costs fall by approximately three dollars for every dollar spent on wellness programs (Baicker, Cutler, & Song, 2010). The possibilities are huge. Health initiatives may include programs focused on smoking, obesity, stress management, back care, nutrition, alcohol consumption, blood pressure or preventive care. Other initiatives may focus on productivity, like encouraging creativity at collaboration spaces, fitness and physical activity, like providing onsite fitness center, challenges and contests, rejuvenation, cool perks and "just for fun" initiatives, and personal growth. The Google seems to be a company that gives a particular importance to health and wellness initiatives at the workplace such as onsite fitness center, collaborative spaces and "just for fun" initiatives (Belfo & Sousa, 2011d).

That probably contributes to be one of best ranked "100 Best Companies to Work For" (Fortune, 2015). The I15 item will try to capture part of this facet.

A factor that seems to increasingly contribute for a higher employee engagement, especially valued at some of the best companies to work for, is the company involvement on the community. Initiatives like helping to reduce carbon emissions, promoting charity dinners or other social responsibility projects may be especially valued by certain employees (Belfo & Sousa, 2011b). The item I16 and the item I17 will try to apprehend some aspects of this characteristic.

The measurement of the easiness given by the company to each employee to take care for his dependents is the idea behind the item I18. The practice concerning the dependent care support (DCS) is a comprehensive concept, which includes not only paid maternity leave or paid paternity leave but may also include on-site child care center, subsidized local child care, child care information/referral services, or elder care (Allen, 2001).

The financial support provided to an employee or his loved ones is considered important to achieve work-life effectiveness. Different financial strategies and programs may be defined to support, for example, some needs of employee's family, like the education ones. These kinds of organizational practices can help employees achieve success either at work or at home. According to WorldatWork, this financial support may include a 401(k) plan, a personal financial planning service, a pension plan, an adoption reimbursement, a tuition reimbursement (student aid/loan program), a dependent care flexible spending accounts, a health care flexible spending account, a voluntary benefit (e.g., auto, home, pet insurance), a mortgage assistance or a pre-negotiated discount on a variety of products and services (WorldatWork, 2008, 2011). Even knowing that Portuguese reality is different from the one existing at the USA and at some other western countries in this matter, which invest more in these strategies and programs, there are still some companies in Portugal that provide some of these financial support to their employees. The I19 item will try to capture a part of this reality.

Other types of incentives that can be considered part of the work-life dimension are the voluntary benefits. For instance, most of the times, companies which have their private parking zone allow their employees may use it in order to help them to come and go from work to home and vice versa. This and other similar incentives that increase employees' well-being without being characterized as cash compensation will be measured by the I20 item.

The same survey of Ernst & Young revealed that, according to 71% of the respondents, a work environment that does not encourage teamwork is also one of the most important reasons to quit a company (Twaronite & Poll, 2015). The item I21 will try to capture the importance of the teamwork's encouragement.

There are some practices related with the company culture that are increasingly important. One of these aspects concerns the culture of listening. There should be a convincing communication with the subordinate, listening to his ideas and demonstrating trust in his capacities to attain the goals (Locke & Latham, 2002). Some of the best companies to work for seem to value a meritocratic atmosphere where the "confrontation" is understood as cultural. There are companies, like Google, where innovation is potentiated by precisely listening employees about their ideas, proving their viability

and challenging them to convert some of the viable ideas into projects to be developed (Belfo & Sousa, 2011b). The item I22 will try to apprehend this facet.

Another aspect that is valorized by some employees is the stability at the workplace . This practice is probably more important to older employees than for the younger employees. In a certain way, this aspect may be opposite to the desire to have challenging problems and situations to solve, a characteristic that may be common to IT professionals (Google, 2010). This facet will try to be captured by I23 item.

An important incentive, apparently important to IT professionals concerns the type of available equipment and data (Google, 2010). Indeed, having large computer resources with amazing powerful technology and updated and complete data availability is tipically considered particularly essential and may definitely leverage the performance of knowledge professionals. The iitem I24 will try to cover this practice.

(c.v) Development and Career Opportunities

According to the Total Rewards Model, development and career opportunities should be another key component of a total reward strategy. On one hand, development comprises a set of learning experiences designed to improve employees' applied skills and competencies, with the objective of engaging leaders to improve the strategies of their organizations concerning human resources and employees to perform better. On the other hand, the carrier opportunities involve defining a plan for employees advance their career goals (WorldatWork, 2008).

The purpose of organizations leaders to increase self-efficacy of their subordinates can be accomplished in several ways. The instrument will try to capture some of these different possibilities. They can do it by providing adequate training that promotes the increase the subordinate's mastery, increasing his probability of performing his functions successfully (item I25). Another possibility is playing a role of a model to follow or elect models with whom the employee can identify himself. Indeed, having access to coaching and mentoring may represent an important career opportunity, and most probably contribute to its development. That is why this instrument includes an indicator (item I26) which captures a facet of this potential incentive. According to the UK Commission for Employment and Skills (UKCES), mentoring is normally a long-term relationship where a more experienced colleague uses their knowledge and experience to support the development of a more junior member of staff, while coaching is a short-term process that targets specific skills to ensure the learner can do a better job (Bentley, 2012). Coaching and mentoring can be seen as talent management methods, which, from an employer perspective, can make a substantial contribution to the development of high performance employees. The staff motivation can also be improved through either coaching or mentoring, by providing a chance to detect training needs and, at the same time, helping employees to make the most of the learning that they agree to do.

Having lack of opportunities to advance at workplace is considered as one of the top five reasons to quit a job. More than three quarters of the workers (76%) which responded to the above mentioned survey said they resigned because they hadn't enough opportunities to advance (Twaronite & Poll,

2015). The adequacy of having enough chances to progress without jeopardizing the lifestyle of each one will try to be captured by item I27.

One of the most important reasons people stay and don't leave an organization is because they like the work they are doing, finding it challenging (Kouzes & Posner, 2006; Schein, 1996). It is common that some professionals feel very attracted by job and problems challenges. Indeed, this seems to be a particularity among IT professionals (Belfo & Sousa, 2011d). For instance, one of the top 10 reasons to work at Google is precisely the fact that "there are hundreds of challenges yet to solve" (Google, 2010). The Google gives the opportunity to propose and develop innovative new products found useful for millions of people. By the way, a healthy competition at workplace can be a positive incentive, representing a specific challenge which can also be associated with a specific reward, like a simple pin, a certificate of achievement or something with more financial value, like a fantastic trip. The item I28 will try to capture the feature related with this kind of incentive.

(d) Alignment construct

As it was previously presented, the incentive alignment is composed by six dimensions.

Research Construct	Survey Item Number	Measure Description
Communications (COM)	A01	Understanding of business by IT
	A02	Understanding of IT by business
	A03	Organizational learning
	A04	Style and ease of access
	A05	Leveraging intellectual assets
	A06	IT–business liaison staff
Competency / Value measurements (C&V))	A07	IT metrics
	A08	Business metrics
	A09	Link between IT and business metrics
	A10	Service level agreements
	A11	Benchmarking
	A12	Formally assess IT investments
	A13	Continuous improvement practices
Governance (GOV)	A14	Formal business strategy planning
	A15	Formal IT strategy planning
	A16	Organizational structure
	A17	Reporting relationships
	A18	How IT is budgeted
	A19	Rationale for IT spending
	A20	Senior-level IT steering committee
	A21	How projects are prioritized
Partnership (PRT)	A22	Business perception of IT
	A23	IT's role in strategic business planning
	A24	Shared risks and rewards
	A25	Managing the IT–business relationship
	A26	Relationship/trust style
	A27	Business sponsors/champions
Technology Scope (TEC)	A28	Primary systems
	A29	Standards
	A30	Architectural integration
	A31	How IT infrastructure is perceived
Skills (SKL)	A32	Innovative, entrepreneurial environment
	A33	Key IT HR decisions made by:
	A34	Change readiness
	A35	Career crossover opportunities
	A36	Cross-functional training and job rotation
	A37	Social interaction
	A38	Attract and retain top talent

Table 9. Constructs and correspondent initial items concerning the alignment

The Luftman's (2003) approach to measure alignment takes into account six alignment criteria or maturity categories: communications, competency/value measurements, governance, partnership, technology scope and skills. The Table 9 lists each one of these six dimensions and the corresponding items that were proposed to measure each dimension. This survey instrument determines a category score for each of the six criteria by evaluating 38 alignment practices from level 1 to 5. As Luftman proposed, an overall alignment score can also be then determined, what can be used as a benchmarking tool. The Appendix 2 presents the complete questionnaire with each initial item description and respective options. The rationale behind each one these items will be better explained below.

(d.i) Communications

One of the most important enablers to alignment is the effective exchange of ideas of business and IT staff and a clear understanding of what it takes to ensure successful strategies. Moreover, aspects like business awareness on the part of IT, IT appreciation on the part of the business, ongoing knowledge sharing facilitators across organizations are possible factes of communications maturity (Luftman, 2003).

The understanding of business by IT team or the opposite, the understanding of IT by business team, as well as the organizational learning are important facets of the communication dimension of the alignment (Luftman, 2003). Indeed, the lack of communication is considered one of the most important reasons to justify the lack of alignment between the business and the IT, either by business managers or by IT managers (Evans, 2004). Such communication is so important that COBIT supports the existence of an IT strategy committee to establish an IT strategy at the board level, to advice about strategic direction and to review main investments on behalf of the full board. This framework also supports an IT steering committee to determine the prioritization of IT-enabled projects, to track status of projects and resolve resource conflict and to monitor service levels and service improvements. These committees should be composed of executive, business and IT management (ITGI, 2007). The items A01 and A02 will try to capture these issues, respectively the understanding of business by IT and vice versa.

Furthermore, organizational learning has becoming an important concern at modern firms. Companies want to learn more, with the hope that it will help them to increase their performance, probably, overcoming their competitors. Initially, knowledge is rooted in individual action, commitment or experience, usually known as tacit knowledge. Yet, organizations depend on the knowledge that is transmissible in a formal and systematic language, known as explicit knowledge. Successful organizations promote the creation of knowledge, by effectively converting tacit knowledge into explicit knowledge, and vice-versa (Nonaka, 1994). According to Nonaka, the knowledge creation can happen through four processes, each one corresponding to each of the four possibilities of transformation among these two types of knowledge. It can happen through socialization, which happens by converting tacit knowledge into tacit knowledge, where individuals learn by interacting with each other's, like, for example, with on-the-job training. It can also happens by combination, converting explicit knowledge into explicit knowledge, through social processes as meetings or phone calls, where individuals exchange and combine explicit knowledge, by sorting, adding, categorizing or

contextualizing it. Another type of conversion is the externalization, where tacit knowledge is converted into explicit knowledge, like, for example, when undocumented business processes are mapped into models that can be later formally analyzed and, possibly improved. Finally, the internalization type, resulting of the conversion of explicit knowledge into tacit knowledge, usually associated to the traditional concept of learning (Nonaka, 1994). Moreover, organizational learning occurs in a multilevel process in organizations, happening at individual, group and organizational level (Vera & Crossan, 2004). According to the 4I framework, proposed by Vera and Crossan (2004), organizational learning starts by intuiting, where each individual learns by processing subconsciously his understanding. Then, in a feed-forward learning flow, individuals interpret, by sharing their learning at a group level. Ideally, they may integrate, by changing the collective understanding at an higher level, at the organizational level. The inverse course, a feed-backward learning flow, is also important and complementary, and it corresponds to whether and how the organization affects each group and individual learning. At organizations with a lower degree of organizational learning, the organizational repositories (culture, structure, systems and procedures) are not aligned with the firm's strategy, and are not consistent with its vision and goals. Also, when there is a lack of organizational learning, individuals don't properly share their learning experiences at group level. When there are higher levels of organizational learning, individuals not only interpret at group meetings, but managers also help to foster collective understanding at an organizational level, by integrating learning among interdepartmental peers. The more aligned an organization is, the more this process is planned and conducted from the top, with an inter-departmental analysis and decision about the desirable learning objectives, ideally, monitoring each organizational learning initiative that was previously defined (Vera & Crossan, 2004). try to capture This alignment property will try to be captured through the item A03.

One facet of communication is its style and ease of access. On one hand, communication can happen in one only direction, either from the business to the IT or the other way around. There is evidence about the positive influence of a better communication (two-way communication) on organizational success. Organizations with an improved two-way communication will probably have an increased productivity and employee retention. Also, broadcasting information from the top to the lower level is not enough and the upward or horizontal communication should be encouraged (Hartman & McCambridge, 2011; Sinickas, 2001). On the other hand, communication can be formal, like receiving an annual official reporting of the company or watching a video with the CEO commenting an important event, or can be informal, supported on some technology-mediated methods as telephoning or sending an email, or using technology free methods as hand-written notes or face-to-face conversations. The correct method to communicate (formally or informally) usually depends on the circumstances. The challenge is to use a correct combination of formal and informal communication on each situation, choosing the most appropriate type of it. Although a formal communication can be more suitable when the purpose is to communicate with a large number of people, informal communication is more adequate to discuss the goals of a team, or what is the expected contribution from each employee of that team and their corresponding results. The younger today's workforce, usually known as the millennials, which are those individuals born between about 1980 and 2000, see technology as part of their lives and have some characteristics as craving for feedback and praise, being overconfident, opinionative, and expecting to be heard (Hartman & McCambridge, 2011), and, basically, supporting a more informal communication style. Also, modern information technology is creating a new rational for

the corporate communication , where communication is not unidirectional in its nature, but requires a two-way communication, where employees are empowered by the new information technology and may easily disseminate their view points (Ihator, 2001). The information age supports a real-time communication, prominently reactive and with feedback. Item A04 try to capture this property.

The measure of practices concerning the leveraging of intellectual assets will try to be done by the item A05. The intellectual capital may seen as being composed by three broad categories, respectively the internal (structural) capital, the external (relational) capital and the competence (human) capital. The internal capital concerns the structures and processes that employees develop and deploy in order to be productive, effective and innovative. The external capital concerns the relationships of an organisation with the external stakeholders, like suppliers, customers, the community or others. The competence capital concerns the skills, attitudes, abilities, competencies and qualities of the employees of an organization (Unerman, Guthrie, & Striukova, 2007). Luftman proposed its measurement with a scale varying from an ad hoc approach to practices considering emerging or formal ways of sharing, at key processes, or at all levels, ideally also involving the partners.

Finaly, the item A06 will cover another type of communication aspect, specifically the type of liaison between the IT and the business. It may vary from nonexistent or sporadic situations, to approaches that facilitate the knowledge transfer, that facilitate the relationship building, preferably involving the partners as well.

(d.ii) Competency/Value Measurements

The value of the IT in a company may be seen as the contribution that IT and the IT organization make to the business in terms that the business and IT understand and accept (Luftman & Kempaiah, 2007). Yet, that contribution is not always effective or is not always understood by the business. The importance of IT staff of being capable to demonstrate their value or competence in terms that business people may understand is considered a key dimension of the alignment (Luftman, 2003). It will try to embrace the main facets concerning the competency and value measurements.

The fact that consumption of IT is significant comparatively to other functions of an organization, because of its ubiquity's nature and the cost of operating and managing the IT infrastructure, justifies the importance of measuring IT investments value (Harris, Herron, & Iwanicki, 2008). It is not easy to choose and define the right metrics for the IT of an organization. Value measurement should not only include merely technical metrics, but should also consider financial analysis and, ideally, measuring according to the business options, human resources (HR) and partners' perspectives (Luftman, 2003). The total costs of ownership (TCO) is an important concept coming from the end of the twentieth century and that tries to measure the direct and indirect costs of an IT asset, from its initial planning and purchase, through its implementation, maintenance and retire. Besides TCO, other financial metrics like the economic value added (EVA), return on assets (ROA) and specially the return on investment (ROI) became popular on measuring the value of IT investments (Harris et al., 2008). The ROI is a metric usually expressed as a percentage or a ratio of an investment, calculated by dividing the benefit (return) of the investment by its cost.

Yet, the usage of only financial valuation methods raises critics about their capabilities in measuring the value of the initiatives for the business strategic goals. That's why other methods should be used, frequently, combining quantitative and qualitative measures. Safety or security improvements, risk reduction, synergy, cost reduction, revenue increases, market share increases, customer satisfaction increases or staff morale increases are some of the metrics which can be used and combined to assess the value of IT investments (Harris et al., 2008). Among the multi-criteria approaches, the balanced scorecard (BSC) is one of the most popular and more mature, using four perspectives: financial, customer, internal business processes and learning and growth (Kaplan, 2010; Kaplan & Norton, 1996b, 2006). Among the objectives of the BSC, the identification and alignment of strategic initiatives is one of the most important. That is why the usage of BSC may represent a higher maturity of organizational alignment in terms of value measurement. The items A07, A08 and A09 will try to assess some aspects of the IT value measurements, respectively the IT metrics that are used to measure that value, the business metrics and the link between IT and business metrics maturities. Likewise, other items used at this instrument, like the items A18 or A19 used to measure the governance dimension of alignment, which will be better explained ahead, also import some principles of BSC to define a more mature organization in terms of the alignment of business and IT.

The practice of service level agreements (SLA) is becoming a common practice in almost all industries and markets when a customer contracts a service provider. The internal departments of companies, especially at large companies, like the IT or the human resources, legal department or real estate, also embraced the concept of SLAs when they are dealing with the other departments of the company (their internal customers). The benefits of SLAs can be organized into five categories. First, they help to improve the communication between the provider and the customer by increasing the understanding, the sharing, and the feedback relative to important information. Second, it helps to manage expectations by clarifying the scope of services and the division of responsibilities, creating a shared language and establishing priorities and service levels. Third, the SLAs help to improve service delivery by objectively assessing the service effectiveness, providing a context for services changes and continuous improvement. Fourth, it strengthens the relationships by helping customers and providers to make contact, fostering a customer orientation and revising troubled relationships. Finally, the SLAs helps to create a business orientation by providing a link between services and business objectives, facilitating the integration of new services offers and creating cost/performance accountabilities (Karten, 2003). At the IT area, the rapid growth of the cloud market is leading to the emergence of new services, new ways for service provisioning and new interaction amongst cloud providers and service customers. The providers are increasingly considering SLAs as a key differentiator to achieve competitive advantage (Kyriazis, 2013). The assessment of the strength relative to this practice will try to be captured by the item A10.

The benchmarking is definitely one of the most popular management practices. It may be applied at three levels. One level considers the framework conditions, covering factors at infrastructure level, as financial, educational or transport funcional areas. Another level considers the sector level, comparing one sector to another sector on an international perspective. Finally, the level of company benchmarking that looks at the individual aspects of success within companies in order to identify both strengths and weaknesses (Pilcher, 1999). The indicator that will be used at the instrument is the item

A11 and considers a scale from situations where that benchmarking practices rarely or never exist up to where it is routinely practiced, acting on accordingly and measuring the results.

The formal evaluation of IT projects is an important facet when measuring the value of information systems. At unaligned organizations, IT projects are not assessed, or, are assessed only when there is a problem. More aligned organizations routinely assess the IT projects and, ideally, act on its findings. The definition of a post-implementation strategy is critical for the acceptance of IT systems and consequently, of its investments. As requirements of IT systems tend to change over time, even after the completion of the project, IT projects should pay more attention to post-project evaluation (PPE) comparatively to other kind of projects. Some questions should be answered, like whether the objectives, the time and cost estimation of the IT projects have been met, and, if no, why that happened. Finally, PPE can suggest improvements in the way analogous projects will be managed in the future (Kuruppuarachchi, Mandal, & Smith, 2002). The item A12 will try to capture this facet.

The last proposed practice of the alignment dimension of competency/value measurements concerns the continuous improvement practices. According to COBIT, the continuous improvement is the basis for ensuring continuous and measurable improvement of the quality of the IT services delivered, that are evaluated by the satisfaction of the business requirement for IT (ITGI, 2007). The item A13 will try to capture this facet. It may vary from none or few continuous improvement practices, where the effectiveness is not measured, up to frequent practices, with measures well-established.

(d.iii) Governance

The maturity of the alignment between the business and the IT seems to be higher when organisations are applying a mix of mature IT governance practices (De Haes & Van Grembergen, 2009). Corporations usually define structures that compose it with a set of principles that identify the rights and responsibilities of those who manage or contribute to those structures. Moreover, mechanisms, processes and relationships are defined to control and direct the corporation as a whole. This is typically known as the corporate governance. In fact, in a company, the IT is managed according to its governance model. An effective governance should address questions like choosing the decisions that must be made, decide who should make these decisions or how will these decisions are made and monitored (Harris et al., 2008). The governance is also an important dimension of the alignment.

The level of participation of the IT staff on the business strategy planning is one of the variables concerning the governance dimension. According to the SAM model (Henderson & Venkatraman, 1993), all strategies need to address both external and internal domains, respectively through the strategic integration and the operational integration. As it was proposed by Henderson and Venkatraman, there are four dominant alignment perspectives (see Figure 10). One of those perspectives is the competitive potential sequence of the alignment process, which starts with the IT strategy influencing the business strategy, which later, influences the organizational infrastructure. In fact, this perspective is only possible if there is a significant and effective participation of the IT staff on the business strategy planning. Likewise, the service level perspective of the alignment process, which starts with the IT strategy guiding the IT/IS infrastructure, and, which later, influences the organizational infrastructure, is also only conceivable if there is a significant and effective effect of the

IT staff on the business. The item that will be used to measure the level of participation of the IT on the formal business strategy planning is the one proposed by Luftman (2003), identified as the A14 item.

Another variable of the governance dimension concerns the level of participation of the business staff on the IT strategy planning. According to COBIT framework, the IT strategic planning is obligatory to manage and direct all the resources of IT in line with the business strategy and its priorities. An IT strategy planning should should be defined by a committee composed by IT and business management in the translation of business requirements into service offerings, developing strategies to deliver these services in a transparent and effective way. Its degree of achievement may be measured by the percent of IT objectives in the IT strategic plan that support the strategic business plan (ITGI, 2007). The item A15 will measure the formal IT strategy planning.

The item A16 tries to capture one aspect often associated with governance: the organizational structure of IT. There are some evidences that suggest that IT organization structure can enable alignment (Luftman & Kempaiah, 2007). People usually give more attention to the alignment at organizational units to create value at the business level than to the creation of value at the enterprise level. The creation of value at a business unit level is achieved through the management of a business strategy based on the creation of products and services that offer a unique and differentiated mix of benefits, usually known as customer value proposition. Corporations not only do this, but also promote and create synergies by aligning the collection of the business units with the shared service units, like the IT services (Kaplan & Norton, 2006). Although in the past the centralized IT governance was the typical adopted organizational structure, especially at large corporations, as personal computers gain more prominence, decentralized structure gain more importance. Yet, today, one IT organization should probably not be entirely centralized or totally decentralized. The federated models are becoming more important because they are quite effective at aligning IT with the needs of the business (Windley, 2002). It seems the federal model of IT governance represents the "ideal" model, sharing decision rights between corporate and business units (Carl R. Adams, Larson, & Xia, 2008).

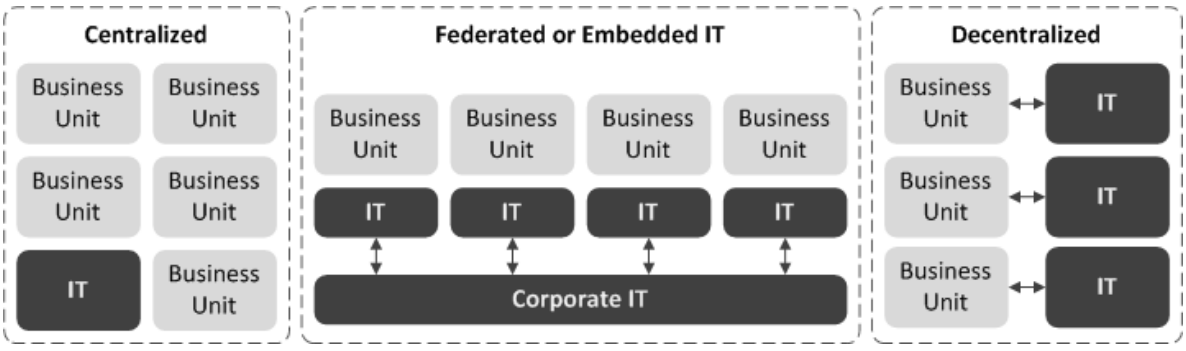


Figure 30: Centralized, decentralized or federated IT structure
Source: Adapted from Luftman, Wander, & Sutaria (2013)

The federated IT organization model is the blend of the centralized and the decentralized model. It presents one centralized IT department and several independent IT departments, one for each business unit. The executive of each IT department reports to both, the business unit executive and the corporate IT executive, adopting a matrix structure like it is shown at Figure 30 (Luftman, Wander, Nathan, & Sutaria, 2013).

Although federal structures are not perfect, sometimes leading to inefficient compromises and to delays in decision-making, they are frequently used because they typically offer a compromise between centralization (and its advantages, like organizational manageability, scale effects, potential synergies or the avoidance of redundancy) and decentralization (and its advantages, like acceleration of decision, rapid implementation of divisional projects or customer proximity) and, thus, providing a mean to avoid conflicts and reduce workload for central decision makers and also a balance between synergy and autonomy (Frey & Buxmann, 2011). Of course there is no one right way to establish a CIO position. There are companies that do not only have the corporate CIO and the business or product line CIOs, as it is usually done at a federal IT organization model, but they also have CIOs that are responsible by global processes, like design, manufacturing or marketing and customer service, in a even more complex matrix structure organization (McClure, 2000). Some bureaucratic organizations are evolving and are being converted into new organizations with much more autonomous employees, which manage their own work. The form of these new organizations reflects the basic requirements of the principle of subsidiarity. The ethical principle of subsidiarity sustains that "a larger and higher-ranking body should not exercise functions which could be efficiently carried out by a smaller and lesser body; rather the former should support the latter by aiding it in the coordination of its activities with those of the greater community" (Melé, 2005).

The CIO´s reporting structure is also a recurrently discussed issue regarding the governance. There are generically four executives to which a senior IT executive may directly depend: the CEO (or the president, or the chairman), a business unit executive, the COO, or the CFO. The 2013 survey of CIO magazine answered by 563 IT chiefs from north America (sixty six percent of respondents) revealed that CIO mainly reported to CEO, although they were not the majority (39% of the respondents), followed by CFO dependency (21%), COO (14%) and corporate CIO (8%) (CIO Magazine, 2013). Apparently, although there might be some types of relationships among them that are more successful than others (Feeny, Edwards, & Simpson, 1992) and probably depending on the firm's strategic positioning, as firms acting as differentiators or as cost leaders (Masli, Richardson, Watson, & Zmud, 2009), when the senior IT executive reports to the CEO, president, or chairman, it usually guarantees a significantly higher alignment maturity to their organization. Then, it comes those whose CIO reports to a business unit executive, the COO, or the CFO, respectively by this order (Luftman & Kempaiah, 2007). This property will try to be capture with the item A17.

The way how IT is budgeted and the rationale for IT spending are other important aspects about the governance dimension of the alignment. The budget may consider the IT in different ways. It can vary from a cost center perspective, where sometimes the spending with IT is really unpredictable, up to one perspective where IT is seen as a profit center, as a subunit of the corporation that is responsible not only for its costs, but that also directly adds to its profit, being responsible for both revenues and costs. Consequently, IT spending may be mainly motivated by cost reduction, or motivated by productivity, efficiency or on being a process enabler, a process driver, a strategy enabler or, the better option, a real competitive advantage, oriented by profit (Luftman & Kempaiah, 2007). According to the 15th annual CIO survey of Harvey Nash, it seems that although the CIOs elect the cost-saving and efficiency projects as the most important priority (with 70% of the respondents), there are other significant reasons to implement IT projects, like the improving of business processes (63%), the developing of new products and services (54%) or the providing of business intelligence (45%)

(Harvey Nash, 2013). The number of CIO who´s main concern in acting as "business game-changers" is increasing year after year. The 2013 survey of CIO magazine showed a tendency where IT organization is less viewed as a cost center (15 percent, versus 21 percent at the previous year) and more as a business developer, which helps the definition of the strategy (15 percent, versus 21 percent at the previous year) (CIO Magazine, 2013). The items A18 and A19 will try to apprehend the characteristics relatively to the way how IT is budgeted and the rationale for IT spending, respectively.

The existence of senior-level IT steering committees is highly recommend (Ali & Green, 2012; ITGI, 2007; McClure, 2000). Unaligned firms do not have these committees, and IT coordination is only made by its CIO. Yet, even at firms where these heterogeneous committees exist, composed of executive, business and IT management, its effectiveness must be proven. The effectiveness of these committees depends on its composition, but also on the regularity and formality of its meetings. Ideally, it includes external partners. The item A20 will try to catch this aspect of IT governance.

The adoption of an adequate governance model and practices that allows an effective portfolio management process is very important, especially at large companies, normally composed by several business units. First, usually there is an initial phase that search for investment proposals or idea generation. Then, if an idea is approved, it should be converted into a project for which a business case is developed based on an adequate feasibility study. At last, projects should be approved. The prioritization of projects is an important tool to support all this portfolio management process. In order to correctly prioritizing the projects, it is crucial to know what the business drivers are (Van Grembergen & De Haes, 2015). Then, a strategic plan of IT should identify the desired targets that should be technologically supported and planned. The strategy should describe the desirable objectives and the correspondent resources that are needed, documenting the “what” and not the “how”. The “how” should be discussed at a lower level with detailed operational plans (Miguel, 2010). Nevertheless, before planning these technological adoptions, the correspondent projects should be prioritized accordingly in order to allow an effective portfolio management. The way this prioritization process is done can vary and may influence differently the alignment between business and IT. The objective of item A21 is to apprehend the maturity of how IT projects are prioritized. According to Luftman, the prioritization may vary from a simple passive reaction to the needs of both business and IT to a planning where both business and IT collaborate in the determination of the priorities that projects should have. Ideally, planning should also consider partners’ priorities (Luftman, 2003).

(d.iv) Partnership

As the relationship among business and IT organizations also ranks highly among the enablers and inhibitors of alignment, Luftman (2003) also elected the partnership among these two sides as another key dimension of the alignment. This relationship has several facets that will try to be captured by the instrument.

One aspect of this relationship concerns on how the business side of each organization perceives the contribution of the IT (item A22). The alignment maturity concerning this relationship may vary from seeing the IT as a cost of doing business up to seeing the IT driving future businesses activities or, even better, seeing it as a partner in the creation of value. Another aspect regards the IT function having (or not) the opportunity to have an equal role in defining business strategies (item

A23). Here, the maturity may vary from a complete envolvement absence of the IT up to letting the IT drive and optimize the business processes, or even better, enabling or driving the business strategy or, having the IT and the business assuming similar roles in the quick adaptation to change (Hoque, 2002; Luftman, 2003).

According to the Institute of Risk Management, the "risk culture is a term describing the values, beliefs, knowledge, attitudes and understanding about risk shared by a group of people with a common purpose, in particular the employees of an organization" (John Adams et al., 2012). A successful risk culture should include, among others characteristics, a distinctive attitude from the top board and senior management in respect of risk taking, a transparent and timely risk information flowing up and down the organization, the encouragement of risk event reporting and a rewarding and encouraging attitude when an appropriate risk taking behaviour happens and a challenging and sanctioning attitude when inappropriate behaviour. The adopted behaviour of an individual or group towards risk is influenced by risk perception and his pre-disposition. This is usually known as the risk attitude. The IT projects have lots of risks. And, some projects are more risky than others. When selecting and planning IT projects, the risk culture will influence the risk attitude of those that are responsible of doing it. If the IT team takes all or most of the risks and receives no rewards, then, probably, some good projects, yet risky, are deprecated. However, if risks and rewards are shared by the IT and business teams and if managers encourage the risk taking, then, the alignment between business and IT can be leveraged. The item A24 will attempt to measure the risk sharing culture.

Other major contributors to a more mature alignment are the management of the IT-business relationship itself and the relationship/trust style. At some organizations, this relationship is not managed at all, while, at others, processes exist, that are sometimes followed, other times complied with or, preferably, continuously improved (item A25). Regarding the style of the relationship, bad organizations have conflictual and relations based on distrust or just transactional relations, while at better organizations, the relation with the IT may become a long-term partnership, ideally, considering IT as a trusted partner and vendor (item A26).

It has been relatively consensual that having a support from top management is a critical factor for successful information system implementations (Fui-Hoon Nah, Lee-Shang Lau, & Kuang, 2001; Sun-Jen Huang, Wu, & Chen, 2013; Procaccino, Verner, Overmyer, & Darter, 2002; Young & Jordan, 2008). Among the advantages of having a business leader in charge, it can be highlighted he is the best one to give a business perspective, helping to align the IT projects with the organizational goals and strategies, or continually encouraging other stakeholders, struggling to manage the resistance or solving conflicts. He may also make a better judgement about the balance between a project benefits and its costs. If a project is unable to recruit either a project champion or a sponsor probably it will have some of these problems. Actually, there are authors that support that the top management support is the most important critical success factor for project success (Young & Jordan, 2008). Item A27 will try to capture this feature.

(d.v) Technology Scope

The technological scope dimension intends to measure how well IT is providing a flexible infrastructure, introducing emerging technologies, adopting the change to business processes and

bringing value to the business and all stakeholders (Luftman & Kempaiah, 2007). This is another key dimension of the alignment that, according to Luftman (2003), should try to assess the extent to which the IT is able to go beyond the back office and the front-office of the organization, to assume a role supporting a flexible infrastructure that is transparent to all business partners and customers, to evaluate and apply emerging technologies effectively, to enable or drive business processes and strategies as a true standard and to deliver customizable solutions according to customer needs.

The item A28 will try to to assess the extent to which the IT is able to go beyond the back office and the front-office of the organization, offering not only traditional systems, as accounting systems or email, or even, transaction systems, but also systems with an expanded scope, acting as a business process enabler or, preferably, acting as a business process driver, eventually having an external scope, driving the business strategy too.

According to the International Organization for Standardization (ISO), a standard is "a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose". Standards are strategic tools for business, facilitating free and fair global trade and, also, allowing the reduction of costs by minimizing waste and errors, and increasing productivity (ISO, 2015). The standards are spread and used at several levels, all over the world. They are managed and promoted by many Standards Developing Organisations (SDO), with some of them acting globally, like the International Organization for Standardization (ISO), International Electrotechnical Commission (IEC) and International Telecommunication Union (ITU), others acting regionally, like the European Telecommunications Standards Institute. (ETSI) and others, acting at national level, like the Portuguese *Instituto Português de Qualidade* (IPQ) (Jakobs, 2007). Besides the hierarchy of formal international, regional and national standards, there is another layer in the form of industry or company standards, used within or between companies or in contractual arrangements with suppliers, known as private standards. This phenomenon is particularly relevant in the ICT sector. Some of these standards, due to their global acceptance, such as the Linux operating system, the OASIS open document format (ODF) or the Adobe's portable document format (PDF), have been transformed into formal ISO/IEC international standards (ISO, 2010). There are also specific frameworks, like the COBIT (ITGI, 2007), the ITIL (Taylor, 2007) or the TOGAF (Group, 2009), proposing best practices about IT management and governance, which are becoming standards widely adopted around the world. Also, some information systems issues have become critical, like those related with information security. For instance, financial information and its accuracy has particularly become a crucial subject after some financial scandals, like Enron, WorldCom, Tyco, AIG, Lehman Brothers or Bernie Madoff. This leveraged the importance of standards like SOX (Sarbanes–Oxley, Sarbox or just SOX), not only in corporate governance, but also on information technology area, especially in respect to the assessment and enhancement of internal control systems of the organizations (Fox & Zonneveld, 2006). The articulation and compliance of standards is responsible for another facet of the technology scope. It may vary from none or an ad-hoc articulation and compliance of standards, through the definition and adoption of standards, initially at a functional level and then at a business unit level and finally at a corporate level, or even better, establishing standards at an inter-enterprise level, involving external partners as well (Luftman & Kempaiah, 2007). The A29 item will be responsible of catching this property.

The concept of information infrastructure is very important for the field of Information Systems. Just like Hanseth and Monteiro predicted, a modern information infrastructure consists not only on an interconnected, heterogeneous and complex group of computer networks, but also includes new services like video-on- demand and electronic publishing, with most of these and other services potentially available on the globalized open bazaar in what the Internet became (Hanseth & Monteiro, 1997). Indeed, an information infrastructure is a complex concept, that can be seen as a "shared, open (and unbounded), heterogeneous and evolving socio-technical system (which we call installed base) consisting of a set of IT capabilities and their user, operations and design" (Hanseth & Lyytinen, 2010). The Information infrastructure refers to digital facilities and services typically associated with the internet and its facilities, like, computational services, help desks, and data repositories. This infrastructural vision is usually associated with something that is "just there," ready-at-hand, transparent, something upon which something else "runs" or "operates" (Bowker, Baker, Millerand, & Ribes, 2010). There can be different dimensions to analyze an information infrastructure and so, to position it. Star and Ruhleder proposed eight dimensions for information infrastructures, respectively, the embeddedness, transparency, reach or scope, learned as part of membership, links with conventions of practice, embodiment of standards, built on an installed base and becomes visible upon breakdown (Star & Ruhleder, 1996).

The architectural integration concerns the embeddedness dimension, where infrastructures are immersed inside other structures, arrangements and technologies. The main objective of the architectural Integration is to define a way of how tools can work together to produce a value added product. There may be an integration that is loosely coupled, where the output of one tool is the input of another tool or an integration that is tightly coupled, where one tool can be invoked from another tool. The A30 item will try to capture this characteristic. Transparency is another one of the most interesting dimensions of information infrastructures and it stands for that infrastructures should not have to be reinvented each time they are needed or assembled for each task, but, on the contrary, they are invisibly supporting those tasks, without users realizing it. This transparency is supported on flexibility, the capacity that an infrastructure has to deal with different requests and challenges. The flexibility is another important dimension and may be seen as the capability of the infrastructure to transparently plug into other infrastructures and tools in a standardized fashion when it is challenged because its scope is modified, frequently because of conflicting conventions ("embodiment of standards" as Star and Ruhleder used to call it). The item A31 will try to catch the infrastructure transparency property or how IT infrastructure is perceived and the item A32 the infrastructure flexibility degree.

(d.vi) Skills

The issues regarding the management of the human resources of the IT team, like hiring or firing, motivating, training and educating, and some cultural aspects are considered under this category of the alignment (Luftman, 2003).

Two of the most important aspects of this dimension relates with who make the key decisions about IT human resources in the organization (item A39) and the strategy behind these decisions (item A34). The ability to attract, develop, and retain the top talented experts is a common denominator of all

kinds of successful businesses, especially at the IT area where the talent of the IT professionals is properly applied to solving business problems and where the decisions about IT talent impact the ability of companies to compete effectively in their respective marketplaces. Because of that, the most essential skill that an executive or manager can have is effective IT human resource management (Trainor, 2011). Indeed, the IT recruitments and other HR management responsabilities among IT staff provide opportunities to departments align staff skills to initiatives and goals, favouring growth either at individual, departmental or organizational level. The item A39 will try to capture this facet. The IT management may share such an important task with the top business manager, but preferably should also have functional influence, with unit management, across the firm and with partners, preferably with the IT advising key IT HR decisions. This facet will try to be captured by the item A34.

Under this dimension of the alignment there are some cultural aspects reflected at the instrument, like the encouragement of the innovation (item A33) or the change readiness (item A35). Relatively to the innovation, it may vary from discouragement to inovate up to some encouragements at unit level, at corporate level, or even also with partners. Regarding the change readiness, organizations may vary of a tendency to resist to change, up to having change readiness programs that are emerging, or that are in place at functional or corporate level, eventually with a proactive and anticipation perspective to change (Luftman, 2003).

There are organizations that allow the employee define his career which may have two paths, one of professional nature and the other of management. Whatever is the way chosen by the employee, he has the possibility to access the higher levels of remuneration and recognition. These parallel career paths may be totally parallel, at Y shape or multiple parallel. The Y path is the most known and has three parts: a common base and two arms; a technical and a management possibility (Queiroz, 2010). Yet, whatever the available career paths in one organization, the existence of career crossover possibilities is positive. There are different categories of career crossovers with different difficulty degrees. The most difficult migration is among paths of different natures, usually resultant of moving technical professionals to managerial functions, which is normally seen as a reward to the employee (Dutra, 2008). The career crossover among business and IT consists on, one hand, by having IT staff working in the business units and, on the other hand, by having business people working in IT. This represents a mechanism that supports the sharing and the management of knowledge across individuals, departments and organizations. Consequently, it is an instrument that attains and sustains business/IT alignment (De Haes & Van Grembergen, 2004). Alternately to simply linear career paths, an advanced career model should allow possibilities of cross-sectional and functional movements, possibly with a spiral development as Schein proposed or with a variety of multidirectional career paths based on flexibility, where employees move around diverse functions within the organization on their way up (Baruch, 2004). The indicator which will measure this aspect at the model is the A36 and also has five optional levels. The first proposed level of alignment maturity about career crossover considers that individuals hardly have career crossovers. At the next two levels, there are some occasional or regular career crossover between the business and the IT function level. At higher maturity levels, regular career crossover opportunities occur at all business unit levels or, even better, they also occur at corporate level (Luftman & Kempaiah, 2007).

An important way to enhance the alignment between business and IT is by cross-functional training. In fact, the continuous education and the cross-training is a mechanism which ensures an ongoing knowledge sharing (De Haes & Van Grembergen, 2004). The cross-functional training comprises teaching an employee who was hired to perform one job function the skills required to perform other job functions. Another way to train employees in respect to other jobs is with job rotation, moving them from one job task to another at planned intervals in a systematic manner. This technique is a method of cross-training that exposes the employees to different experiences on a temporary basis. This technique gives employees the opportunity to learn by developing skills, but also gives the employer the opportunity to learn more about its own employees and how they perform at different jobs and, sometimes, enhances the employees job satisfaction, by avoiding they become bored with continuous repetition of same tasks (Eriksson & Ortega, 2006). The item A37 will try to measure this characteristic and varies from situations where there are no opportunities of cross-functional training or job rotation, up to formal programs run by all units, or even better, programs running across enterprise or even with partners (Luftman, 2003).

The alignment depends on several organizational learning facets. Another of them is the degree of interaction of people from business and IT. This role is not adequately recognized. The social interaction may happen at an individual level, with a minimal interaction, or at a group or organizational level in a more disseminated way (Balhareth, Liu, & Manwani, 2012). According to the the item A38 of Luftman's instrument (2003), the ideal situation is to have more that just a strictly business relationship, but a connection based on trust and confidence, idealy involving customers and partners.

(e) The proposed model

The hypothesized model drawing is based on the simplified version of the conceptual model previously presented at Figure 3. Like any other structural equation modeling (SEM), its representation undertakes four general rules:

1. Latent variables/factors are represented with circles and measured (or manifest) variables are represented with squares.

2. Lines with an arrow in one direction show a hypothesized direct relationship between two variables. The line should be originated at the causal variable and point to the variable that is caused. When there is no causal relationship between two variables no line is represented between them.

3. Lines with an arrow in both directions should be curved and represents a bi-directional relationship (i.e., a covariance). Arrows representing covariance should only be allowed for exogenous variables.

4. A residual term should be added in the model for every endogenous variable. In these cases, a residual term should be represented by a circle with the letter “e” written in it, which symbolizes an error. At latent variables which are also endogenous, the residual term is not called error but called a disturbance, and therefore it should be represented by a circle with the letter “d” written in it, symbolizing a disturbance.

The proposed model is decomposed into the structural sub-model and the measure sub-model.

(e.i) Structural sub-model

Accordingly to these rules, Figure 31 presents the proposed structural sub-model.

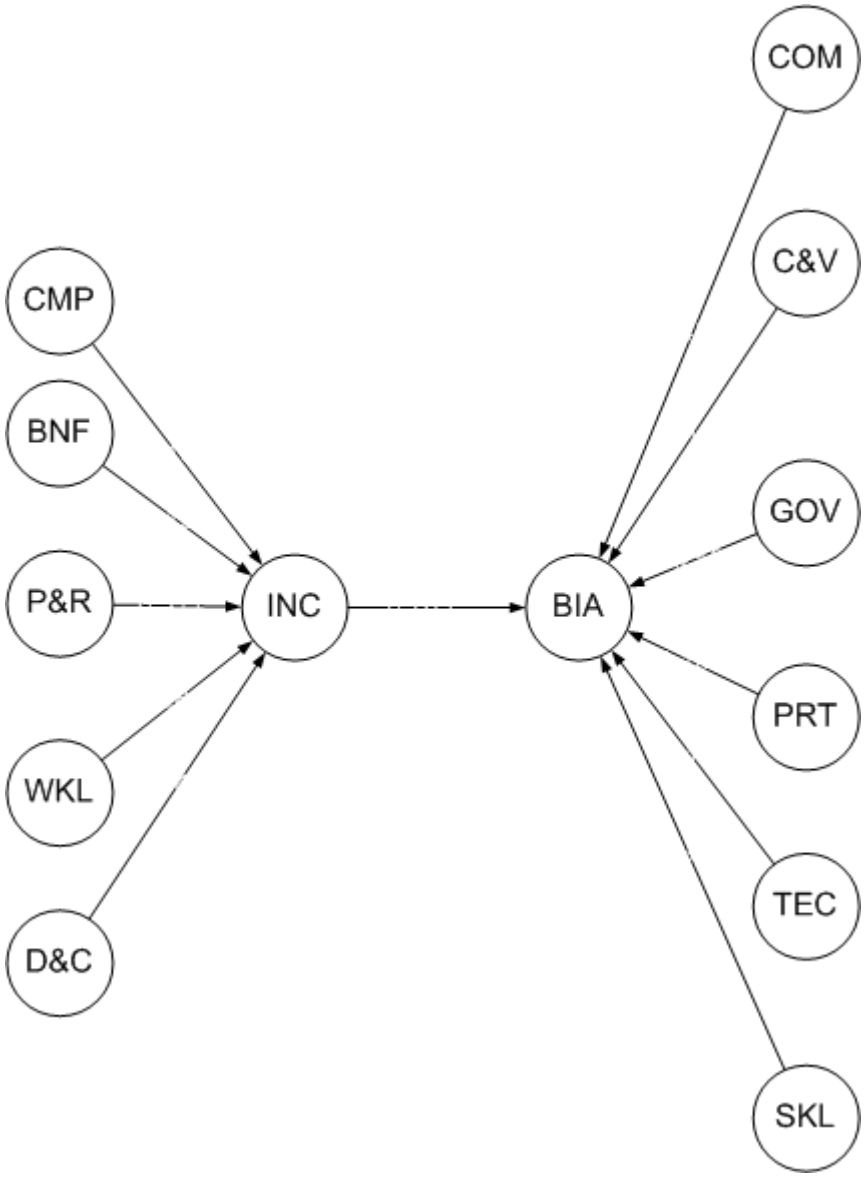


Figure 31: The proposed structural sub-model

This diagram represents a causal model, with two second order latent variables; incentives as the causal variable and alignment, as the variable that is caused. The second-order variable incentive is formed by five latent variables of first-order: compensation, benefits, performance and recognition, work-life, development and career opportunities. The second-order variable alignment is formed by six latent variables of first-order: maturity of communications, measures of competence and value, governance, partnership, technology scope and skills.

The usage of complex constructs can be operationalized through a higher level of abstraction, using higher-order models or hierarchical component models (HCM). There may be some reasons for the utilization of HCM at PLS-SEM. First, the model can become more parsimonious and easy to

understand because the number of relationships in the structural model can be reduced. Second, if the constructs are highly correlated, a second-order construct can reduce such collinearity issues and may solve the discriminant validity. Third, if formative indicators show high levels of collinearity, the set of indicators may be split up on separate constructs and defining a new higher-order construct (Hair et al., 2014).

(e.ii) Measurement sub-model

The Figure 32 presents the measurement sub-model. As it can be seen, and as it is advisable, each latent variable of the measurement component of the structural equation model is operationalized by 3 or more manifest variables as it is recommended (Iacobucci, 2010; Marôco, 2010).

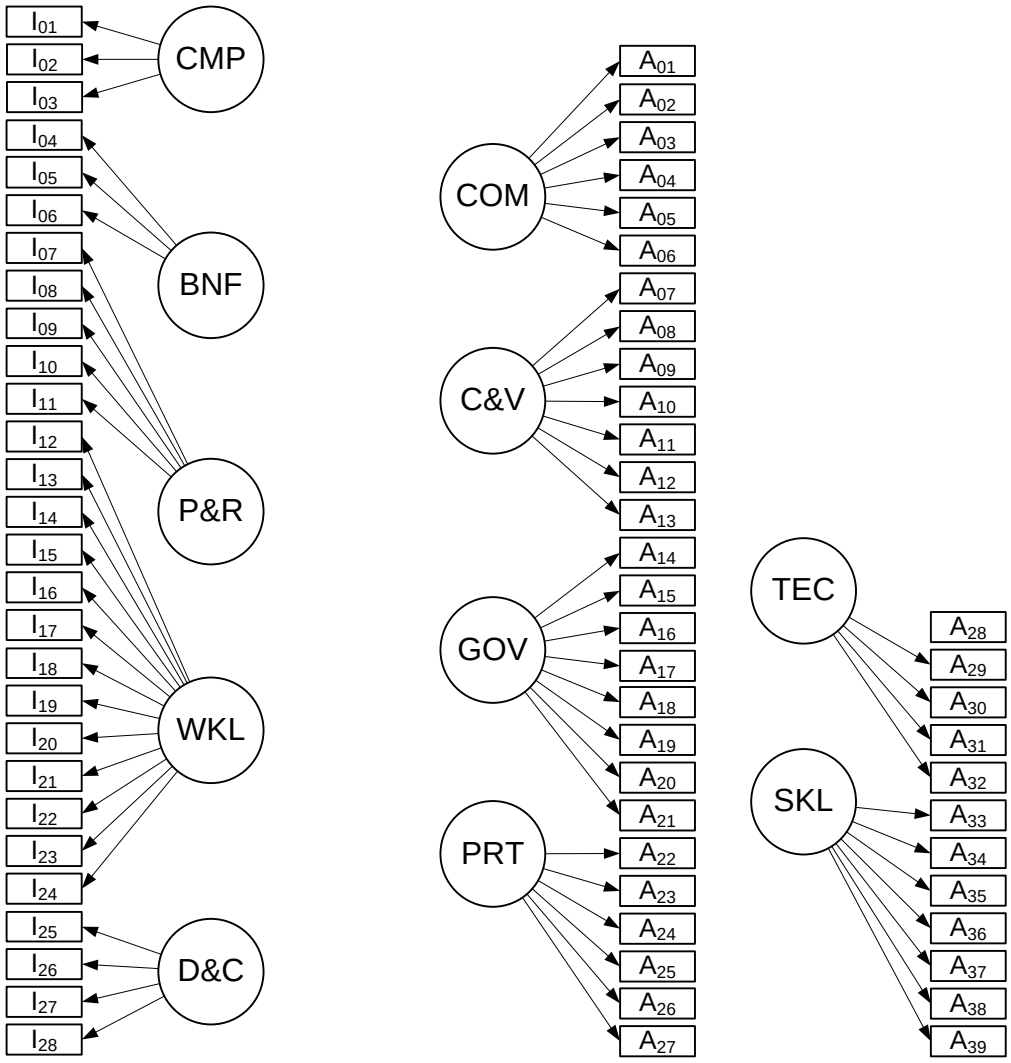


Figure 32**:** Measurement sub-model

Although they are not represented, so that the model is more simplified and clear, the model also includes one measurement error ε_i is for each i^{th} indicator and one common error term ζ_j for each one of the two formative constructs of higher level, respectively, incentive and alignment. For example, ε_{I25} represents the measurement error of the I25 indicator and ζ_{BIA} represents the common error term of the incentive construct.

3.5 Unit of analysis, informants, universe, target population and sample

(a) Unit of analysis

The unit of analysis of this study is the enterprise with a large or medium dimension.

Like on some other previous researches, this investigation studies the alignment on large and medium-size companies (Chen, 2010; Cragg et al., 2002; Luftman & Kempaiah, 2007; Timothy Ryan, 2010; Silvius, 2007). Small (and micro) companies are not included on this research. Although alignment is also reachable to small firms and it would be interesting to study the alignment phenomenon such firms as others researchers have already done in the past (Cragg et al., 2002; Hussin, King, & Cragg, 2002), the small firms are different from large ones, having several specificities that would deserve a distinct approach.

Small organizations usually have a centralized coordination that limits explicit mechanisms to promote functional alignment. On the contrary, large firms normally have divisions along product lines and use decentralized governance structures to coordinate divisional activities. Certain IT governance structures are only possible at larger organizations, either enabling the creation of value at a business unit level, but also creating synergies by, for instance, aligning the collection of the business units with the shared service units, like the IT services (Kaplan & Norton, 2006). This and other aspects of IT structures will be further addressed when the governance dimension of alignment is discussed.

(a.i) Enterprise definition

The European Commission qualifies an enterprise as "any entity engaged in an economic activity, irrespective of its legal form" (European Commission, 2015). Also, it sees an economic activity as being "the sale of products or services at a given price, on a given/direct market".

While in business, the word enterprise can also be understood as what an individual can perform in order to advance, prosper and attain wealth, not necessarily organized as a formal entity, the definition of the European Commission restricts it to the need to be formally organized.

The European Commission concept of enterprise includes organizations like self-employed, family firms, partnerships and associations regularly engaged in an economic activity. According to the Eurostat "the enterprise is the smallest combination of legal units that is an organisational unit producing goods or services, which benefits from a certain degree of autonomy in decision-making, especially for the allocation of its current resources" (Eurostat, 1993). It may carry out one or more activities at one or more locations and may be a sole legal unit.

The determining factor to what can really define an enterprise is not its legal form, but its economic activity. Indeed, the enterprise concept may have several meanings. One of them is the company concept. A company is typically an organization engaged in an economic activity for the purpose of earning profits for its stakeholders. So, although an enterprise may have, or may not have a profit orientation, the company normally has.

So, a company is an enterprise, while an enterprise may not be a company. For instance, there are some special enterprises that are hardly considered companies. These enterprises are corporate public entities and the main objective of a significant number of them is not really earning profits, but achieves a complex range of political, economic, social, and environmental objectives. In Portugal, some of these companies are known as the EPE (*Entidade Pública Empresarial*) acronym, which are firms, created as legal entities of public law, with a corporate nature, created by the state but run by a third party indicated to do it. Some examples of these firms are managing some of most important hospitals in Portugal, some of them surveyed at this study. Even so, with the growth of private entities that are providing a public service over the last several decades all over the western world, the line between public institutions and private entities is becoming less clear in certain areas of public service.

After making this remark, with regard to this research, as it is only focused on medium and large sized enterprises and the great majority of those enterprises are effectively looking to earn profits for their stakeholders, these both words will be used indifferently at this document.

(a.ii) Micro, small, medium and large sized enterprises

According to the European Union, a micro, small and medium-sized enterprise is defined according to their staff headcount and turnover or annual balance-sheet total. A medium-sized enterprise is defined as an enterprise which employs fewer than 250 persons and whose annual turnover does not exceed EUR 50 million or whose annual balance-sheet total does not exceed EUR 43 million. A small enterprise is defined as an enterprise which employs fewer than 50 persons and whose annual turnover and/or annual balance sheet total does not exceed EUR 10 million. A microenterprise is defined as an enterprise which employs fewer than 10 persons and whose annual turnover and/or annual balance sheet total does not exceed EUR 2 million (European Union, 2003). The following Table 10 summarizes the criteria for defining the size of a enterprise according to the European Union, and so, in Portugal.

Size category	Employees	Turnover	Total Balance Sheet
Large	≥ 250	> €50 m	> €43 m
Medium-sized	< 250	≤ €50 m	≤ €43 m
Small	< 50	≤ €10 m	≤ €10 m
Micro	< 10	≤ €2 m	≤ €2 m

Table 10. The criteria for defining the size of a enterprise according to the European Union

This study encompasses medium and large sized enterprises.

(b) Informants

(b.i) Key informants

This study is based on the perceptions of key informants. The use of perceptual measures has been popular in empirical MIS researches (Kearns & Lederer, 2003; Segars et al., 1998). Kearns and Lederer, referencing other researchers (Carl R Anderson & Paine, 1975; Hambrick & Snow, 1977), stressed that the way managers perceive their environment is more critical to organizational strategy than objective or archival, measures of the environment. Archival data cannot capture a picture of the firm´s environment which can be provided by perceptual measures from the viewpoint of key informants familiar with relationships.

The differences in perception when assessing the alignment of one firm may occur if respondents are different. Some studies about alignment, in an attempt to reduce bias or just because they wanted to collect answers to different questions from the organizations and so, using different instruments, choose a combination of different respondents, one part coming from business side and the other part coming from the IT side (Byrd et al., 2006; Chan et al., 1997; Chen, 2010; Evers, 2010; Hartung, Reich, & Benbasat, 2000; Luftman et al., 2010; Reich & Benbasat, 2000; Sabherwal & Chan, 2001; Sledgianowski et al., 2008). Yet, the perspectives of business and IT managers seem to be largely equivalent about the success factors for strategic alignment (Burn & Szeto, 2000) and, it appears that the assessment of the alignment made by those two functional groups is not significatively different one with each other (Luftman & Kempaiah, 2007; Silvius, 2007).

Probably because of those reasons or, because it is not very feasible or practicable the collection of data from multiple informants, a significant number of studies used just one informant per organization to answer about the alignment, either on the side of business or on the side of the IT (Almajali & Dahalin, 2011b; Bergeron et al., 2004; Cragg et al., 2002; Cragg et al., 2013; Cragg, Tagliavini, & Mills, 2007; Cumps et al., 2009; DeLisi & Danielson, 2007; Denford, 2009; Kearns & Lederer, 2003; Anabel Gutiérrez Mendoza, 2009; Segars & Grover, 1999). Also, when a contact of a representative manager of each selected firm is not available it is common to send the questionnaire addressed to the CEO, to be answered by him or by some appropriate manager indicated by him (Bergeron et al., 2004). Consequently, this research did not oblige more than one informant. This study was mainly built based on the perceptions of a single informant of each firm. If it was possible to collect the answers to the questionnaire of more than one informant, all answers were reflected on the company assessment, but this was not considered crucial.

The use of different informants, where each one answers a part of the questionnaire is especially advisable when the part assigned to someone corresponds to his specialization in the organization. This approach usually considers a specific instrument to each main construct, each one answered by a different informant. For example, the survey conducted by Chan, Huff, Barclay and Copeland (1997) developed four instruments, namely: realized business strategy, business performance, IS effectiveness and realized IS strategy. Then, they asked different key informants to answer each instrument. Although "realized IS strategy" was mainly answer by CIO, the other instruments were mainly answered by CEO (realized business strategy), CFO (business performance) and Vice-Presidents of end-users (IS effectiveness) (Chan et al., 1997). Nevertheless, at this study, on the one hand, alignment is a

construct that has to do, not only with IT managers, but also with business managers. On the other hand, the measures relatively to the incentive construct should be answered by the same informant whose perceptions about the alignment were collected in order to reduce the bias among those that do the alignment and their personal incentives.

Consequently, this study invited the head of the selected enterprise to answer the questionnaire. Also, it was suggested that the questionnaire could be answer by another representative manager of the enterprise indicated by him (independently coming from the business or from the IT). The database provided by Informa D&B, with 1000 medium enterprises and 1000 large enterprises, was used to prepare and send the invitations to participate in the web survey by email.

(b.ii) Informant's job

The survey defined the middle or top managers, either from the business or IT, as potential respondents. The respondents in each firm were preferably the CEO or the CIO, but could also be persons with other positions of top, tactical or operational management. Other positions may include the company chairman, all other types of chiefs, other type of IT managers, financial managers, commercial managers, human resources managers or sales managers.

Some other alignment researches in the past, that analysed the possible influence of the functional area of the respondents (business or IT), support that the alignment assessment made by those two functional groups is not very different one with each other (Luftman & Kempaiah, 2007; Silvius, 2007). Consequently, this is one of the informants' facets that deserve a closer look during the phase of the results interpretation.

(b.iii) Informant's gender

On the last decades, as more women arrive to managerial positions, the communication differences based on gender at workplace worldwide has becoming an important challenging situation. Today, men and women at workplace can be equivalent in position, experience, expertise, professional experience, educational background, and intelligence.

Yet, although these similarities may exist, they are usually different in the way they communicate, specifically at the workplace environment (Barrett & Davidson, 2006). In short, on one hand, men usually take the instrumental communication approach, looking for an answer right away, moving straightly to solutions and problem solving and seeking to establish their hierarchy and supremacy. On the other hand, traditionally, women, take the expressive communication style, trusting in others, talking about the problems, solving them more collaboratively and being more sensitive to certain issues than men, looking to build, maintain and strengthen the relationship (Ahmad, 2014; Koch, Muller, Schroeer, Thimm, Kruse, & Zumbach, 2005; Mohindra & Azhar, 2012).

Furthermore, the classical literature in social psychology states that men are more task-oriented and pragmatics and women are more person-oriented or relationship-oriented (Ahmad, 2014; Minton & Schneider, 1980), and, consequently, preferring approaches with a more demanding competency and value measuring orientation, i.e., assessing more critically their companies about the maturity of this

dimension. These and possibly others specific characteristics of men and women also deserve to be considered when analyzing the results.

(b.iv) Informant's age

The age is an important individual characteristic. Different generations have different values and mid-sets and this leads to different perceptions, motivations and attitudes. The age categories adopted at this instrument are based on those most used in IT studies. The four generations cohabiting in the workplace are the silent generation, Baby Boomers, generation X and Millennials or the generation Y (McCrindle & Wolfinger, 2009). Although there could be the problem of using stereotypes, each one of these generations has analogous characteristics which are interesting to depict in order to better understand their involvement in the workplace context. Even though there is no absolute consensus around the birthdates of persons from these generations (Gesell, 2010; Simons, 2010), some of the most important characteristics in the context of the workplace and information technology are presented below.

The persons belonging to the silent or veteran generation were born 1925 and 1945. Some of the values of this World War II (WW2) generation are the hard work, conformity, dedication, sacrifice, and patience. The work style of this generation admits a delayed recognition and reward (Gesell, 2010). These workers were born before the first commercial computer was made, the UNIVAC (at 1947).

The Baby Boomers were born between 1946 and 1964 and its name is due to the significant birth rate increase which happened after the WW2 during that period. These persons are usually optimistic and oriented to teamwork. They also expect a personal gratification and growth, valuing ethic at work (Gesell, 2010). Baby Boomers attended to the born of the second generation of computers, which evolved from the valve computers to computers that were using transistors (developed at 1947 by William Shockley, John Bardeen e Walter Brattain from the Bell Labs). This technological innovation allowed the development of new computers, usually used at public organizations and big companies, characterized by being much more small and fast than the previous valve computers.

Those who were born from 1965 to 1980 are considered belonging to the generation X, abbreviated as gen X or Sandwich generation, because they are between two larger groups; the Baby Boomers and the Millennials (Gesell, 2010). This generation is characterized by being self-reliant, global thinkers, funny, informal and individualistic. They mistrust the institutions, they value balance, diversity, flexibility, freedom and a place to learn (Gesell, 2010; Simons, 2010). They were born using the PC, they use technology and they are multitasking (Simons, 2010).

Millennials, generation Y or just gen Y, are those who were born from 1981 to 2000 and tend to become the largest group at workplace. Although a big part of them are still not at the workplace, some of them are already on organizational leadership (Gesell, 2010). These employees are confident, optimistic, sociable and collaborative. They give no relevance to institutions, they value the civic duty, they celebrate the diversity and they have open-mindedness. These workers are prepared for demands and have high expectations (Gesell, 2010; Simons, 2010). They were born using the Internet, they do not use, but assume the technology and they perform multitasking fast (Simons, 2010).

Those born after the millennials generation are called the post-Millennials by some authors or as generation Z or iGeneration by others. They were born with the social media and the mobile technology. The majority of these young people discover and connect with hundreds of others teens from all around the world. They play games online and they learn on the web, by "Goggling" a question. These persons are still not at the workplace.

The categories of the respondents' age used at this questionnaire match those previously presented generations, respectively, the silent generation (although most of them are retired), baby boomers, generation X and Millennials or the generation Y. Consequently, the four taken classes are:

- Born before 1946 (more than 69 years old)
- Born from 1946 to 1965 (from 50 to 69 years old)
- Born from 1966 to 1980 (from 35 to 49 years old)
- Born after 1981 (less than 34 years old)

The generation Z is still not working, and so, was not considered.

(c) Universe and target population

The universe corresponds to all subjects, phenomena or possible observations obeying to certain characteristics (Almeida & Freire, 2008). The universe considered at this study consists of all large or medium-sized enterprises. The (target) population is the set of individuals, cases or observations where the researcher wants to study the phenomena (Almeida & Freire, 2008). The chosen population of this research is composed by the large and medium-size companies in Portugal.

Although the number of investigations on the alignment that has been done for two decades so far in some of the major Western countries is significant (Cumps, Viaene, Dedene, & Vandenbulcke, 2006; Gutierrez, Orozco, & Serrano, 2009; Johnson, 2014; Luftman, 2000; Preston & Karahanna, 2009; Reich & Benbasat, 1996, 2000), Portuguese companies still have been poorly studied or have even had a complete lack of studies on the alignment.

The Table 11 resumes the number of enterprises in Portugal by size, their number of employees and their correspondent personnel expenses in 2011 (INE, 2014).

Company Dimension	Number of companies	Number of employees	Turnover (10^6 €)	Gross value added (10^6 €)	Personnel expenses (10^6 €)	Expenses per Employee (€)
SME						
Micro enterprises	1.019.494	1.574.424	60.664	15.583	9.432	5.991
Small enterprises	36.645	669.143	61.953	14.290	10.727	16.031
Medium enterprises	5.628	499.076	65.044	15.517	10.238	20.514
Large enterprises	1.015	769.023	138.210	30.579	17.056	22.179
Total	1.062.782	3.511.666	325.871	75.969	47.453	13.513

Table 11. Number of non-financial enterprises, employees and personnel expenses in 2011 by company dimension in Portugal
Source: Retrieved from INE (2014)

According to the official Portuguese statistics institute, the main sections of economic activities are the following:

- Agriculture, Livestock, Hunting, Forestry and Fisheries
- Extractive Industries
- Manufacturing industries
- Electricity, gas, steam and water
- Building
- Trade (wholesale and retail); vehicle repair
- Transportation and storage
- Accommodation, catering and similar
- Activities of information and communication
- Financial and Insurance Activities
- Real estate activities
- Consulting, technical and other
- Education, health and other service activities

These economic activities were used at the survey as options of the respondents in order to facilitate the posterior analysis of the results.

(d) Sample

(d.i) Sample size

An important issue is the definition of the sample size. The knowledge about the minimum number of observations which are necessary to have a good SEM model makes us develop the necessary efforts to collect this amount of required data. There are several aspects that determine different sample size needs, like the number of indicators and the complexity of the model.

Traditionally, MIS researchers used to define a lower bond for the adequacy of sample sizes by adopting an ad hoc rule of thumb which proposes the choosing of 10 observations per indicator. This rule was known as the "rule of 10". Yet, more recently, the usage of the ratio of indicators to latent variables was considered to be better than the usage of the number of indicators to support the calculation of the lower bond of the sample size. This ratio can be defined as r = p/k, where p is the number of indicators and k the number of latent variables. Latent variables with only one or two indicators have large bias. Yet, if there are three or more indicators, the bias almost disappears. And if this happens, the sample size of 100 is usually sufficient for a convergent and proper solution. Equation 3 suggest a lower bond for the adequacy of sample sizes depending on the r ratio, by considering different models (from Monte Carlo simulations that have appeared in the literature) and their pairs of minimum sample size versus different r ratios (Iacobucci, 2010).

$$n \geq 50r^2 - 450r + 1100$$

Equation 3: Lower bond for the adequacy of sample sizes depending on the r ratio

The proposed measurement at this research model, that is going to be better explained ahead, has 66 indicators and 13 latent variables. Consequently, the r ratio of the model is 5.1, with every latent variable with at least three indicators. By the rule presented at Equation 3, that r results on a minimum sample size of 104 observations.

Taking into account that previous and similar studies, also based on senior managers informants, had a response rate of around 10% (Ali & Green, 2012; Aloini & Martini, 2013; Cook, 2011; Denford, 2009; Doherty, 2010; Kouakou, 2013), it would be necessary to contact at least 1000 firms to get approximately 100 answers.

(d.ii) Sample method

The sample took into account the chosen population, and so, it included large and medium-size companies in Portugal. A combination of methods was used in order to reduce the non-response bias.

sample characteristics	large companies	medium-size companies
companies' sample method	total population sampling [2]	convenience sampling
sample size	~1000 companies	~1000 companies
companies' respondents sample method	convenience sampling purposive sampling snowball sampling	
source of information	Informa D&B LinkedIn social network	

Table 12. Companies' sample methods, sizes, sources of information and sampling respondents' methods used

The Table 12 presents the methods used to select companies, their respective sizes and sampling methods used to select respondents at those companies and the correspondent information sources.

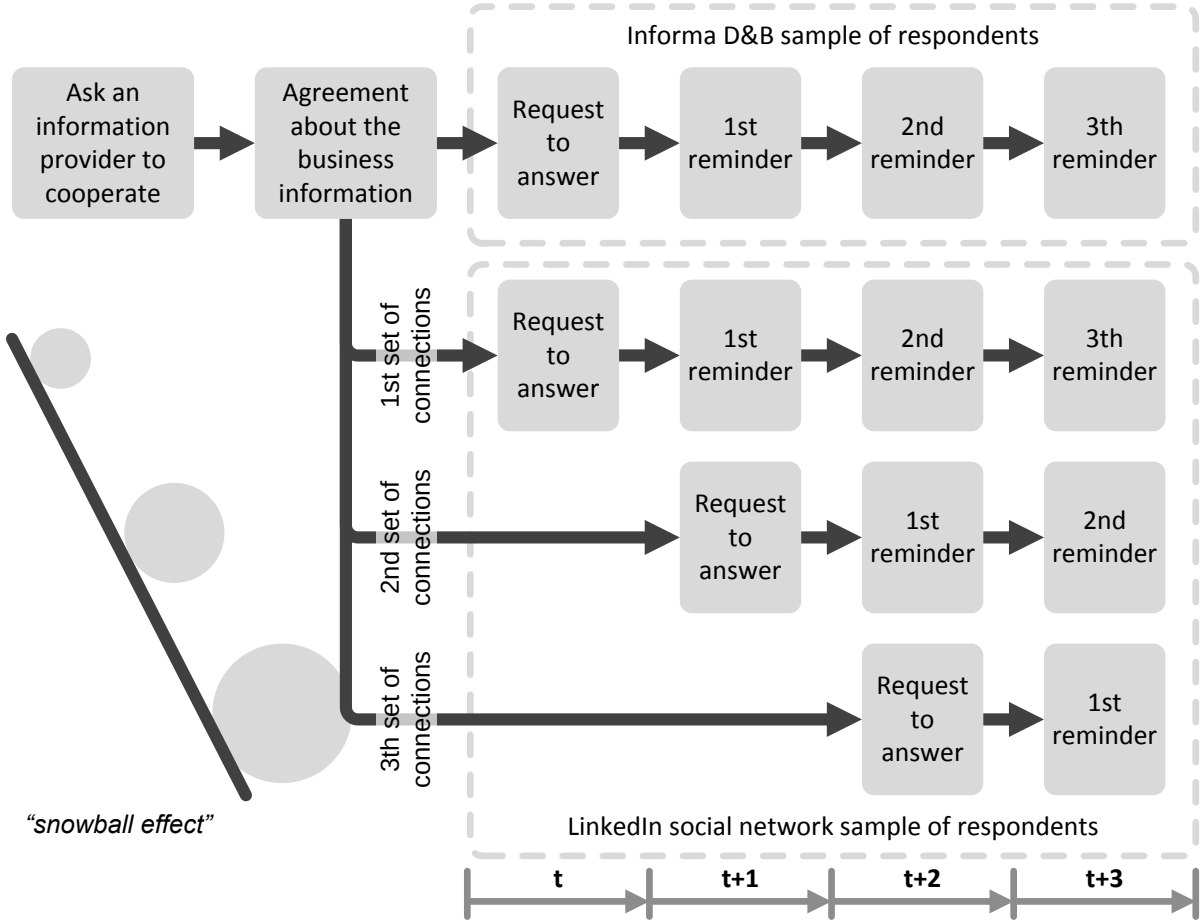


Figure 33: Process of collecting the sample of companies and respondents

The strategy adopted to get the sample was, initially; get the sample of companies and their top-level management contacts. This was possible by asking the collaboration of a company which main mission is dealing with businesses information. Those contacts of possible respondents would be used to launch an initial set of invitations to answer the survey. Then, the idea was to expand the number of

[2] This sample did not consider companies from the banking and insurance sector.

potential respondents using the LinkedIn social network. The process of collecting the sample of companies and respondents is illustrated at Figure 33.

As it was presented earlier, the population of large and medium-size companies in Portugal is constituted by approximately one thousand and five thousand and six hundred companies, respectively. So, the large companies sample corresponds to nearly the total population sampling and the sample of medium-size companies corresponds to a significant convenience sample of those types of companies.

The sample of medium-size companies, even using a non-probability sampling method, should take into consideration different characteristics of companies, especially, their industry. Apparently, the alignment´s maturity differs across industries. For instance, firms from the banking industry are more likely to have information systems strategy and implementation processes connected to the business goals, than other firms in most other sectors (Broadbent & Weill, 1993). Therefore, a cross-section of industries should be used in the sample (Chen, 2010; Luftman et al., 1999).

(d.iii) Informa Dun & Bradstreet sample of companies and respondents

The Informa D&B, one company founded in 1906, which worked in the Portuguese market with the name D&B (Dun & Bradstreet) and today, in Portugal and Spain, leads the provision of information and knowledge of the business community, helping to support business decisions of its customers for over 100 years (Informa, 2015), was challenged on 9 of September 2014 to support this research. The decision to ask to the Informa D&B for their support was based on the fact that, according to their official site, they have information on over 1.5 million business entities and 1.7 million governing bodies, with a database reflecting the totality of the Portuguese companies.

The Informa D&B was asked to provide a database with all the large enterprises (number of employees >= 250 and turnover >50m€ and total assets >43m€) and a sample of 1000 medium-size representative companies (number of employees >= 50 and number of employees < 250 and turnover <=50m€ or total assets <=43m€) of its global database. This request was accepted after signing a confidentiality agreement between me and the Informa D&B enterprise.

The criteria proposed to Informa D&B to define the sample was defined as follows:

- With respect to large companies, the population dimension is constituted by approximately 1000 enterprises. Since it was expected that only about 10% to 20% of these respond to the survey that would correspond to approximately 100 to 200 companies, a dimension which may be considered appropriate. Therefore, the Informa D&B was asked to send the data relatively to all large enterprises of their databases (excluding financial and insurance companies), which approximately correspond to the entire population of this type of Portuguese enterprises.
- With regard to medium-sized enterprises, it was requested a sample of about 1,000 companies. Although there are about 5,000 medium-sized Portuguese enterprises, the same sample dimension of 1000 enterprises was considered suitable, because, considering the same non-response rate, which would approximately correspond to the same 100 to 200 respondent companies. In this case, it was asked to use the stratified sampling method to get

this sample, trying to ensure that the 1,000 companies of this sample would be distributed (among the various sectors and regions) as similar as possible with its universe.

The requested data for each enterprise was:

- Company Name
- Headquarters of the Region
- Economic sector
- Number of employees
- Turnover
- Total assets

Regarding the respondents, it was also requested, if it were possible, two contacts (at least) of each company: one, of a top-level manager or another significant business manager, and another, of the chief information officer or, someone else, with a similar function. For each one of two informants, it was requested the name, the phone contact, the email, the function at the enterprise. So, in fact, the sample selection of the respondents at each company was made through a purposive sampling approach previously agreed with Informa D&B, as only a particular subset of employees were qualified to answered the survey (preferably strategic or tactical managers). Yet, although the adequate managers of those companies were previously identified, sometimes, the available email was the one from a secretary or a management assistant that should forward the message to the intended recipient (convenience sampling).

After the agreement was signed, the technical services of Informa D&B prepared and sent one database constituted by 2000 enterprises where the first half of them "probably" are large enterprises, respectively ordered by turnover amount, and the other half are medium enterprises. The indicators of the database provided by Informa D&B were relative to the year of 2013, the last available year when the agreement was made. The technical services of Informa D&B said they only have one contact per enterprise.

The term "probably" is used above because, although the most enterprises doubtless have, the usage of the correct criterion to be considered large or medium sized enterprises, there are a few where the criterion is not so clearly applied or, at least, simply applied. For instance, in Portugal, the fourth biggest enterprise by turnover is the GALP GÁS NATURAL, S.A., an enterprise with just 7 employees. So, using the simple criteria that characterize a large enterprise, this enterprise could not be considered one of them because it does not have the minimum number of 250 employees, the most important criterion to define the size of an enterprise.

Yet, the criterion used to characterize the size of an enterprise is just valid when the enterprise is autonomous, which means it is not controlled by another one. A controlling position is normally defined (there are some exceptions) when another enterprise holds at least 25% of its share capital (Eurostat, 1993). And, that is "probably" what happens with the enterprise Galp Gás Natural, S.A., since there are other large Portuguese enterprises that are probably part of this group, like the Galpgeste – Gestão de Áreas de Serviço, S.A., an enterprise with 1.125 employees.

So, as it is almost impossible to completely check the size criteria of the enterprises of the provided database just with the three indicators (number of employees, turnover and total assets), it is assumed that the enterprises belonging to the database sent by Informa D&B meet the correct criteria, either the 1000 large enterprises or the other medium sized enterprises. Furthermore, as it was said before, the Informa D&B is a specialized enterprise that claims to have a database reflecting the totality of the Portuguese companies (Informa, 2015), which helps to know these control relations among them.

(d.iv) Snowball sampling using LinkedIn social network

Furthermore, in order to reduce the usual high non-response rates and so, the corresponding high non-response errors, other informants working at the companies of the database sent by Informa D&B and some other few managers working at other companies not part of that initial list, like some financial and insurance companies (to try to include this sector at the study), were also invited to answer the online survey. As the unit of analysis of this study is the company, if there is no answer to the invitation email sent to the Head of the enterprise, then, these other invitations can be a way to try to get answers from others informants from that same specific enterprise. Although not considered critical getting more than one answer for an enterprise, if more than one response is received, then an average of these responses is calculated for each item. This procedure can also allow increasing the possible number of enterprises' responses. These informants will be collected from the social network LinkedIn, the world's largest professional community, with members working in companies with every size. LinkedIn is "the largest group anywhere of influential, affluent and educated people", with more than 347 million professionals, representing over half of the 600 million professionals on the planet (LinkedIn, 2015).

The sample method that used LinkedIn to increase the number of potentials respondents of selected companies explored the existence of interpersonal relations and connections between people supported by this social network that may facilitate the possible collaboration of new respondents. This technique is called snowball sampling. This kind of method is based on a non-probability sampling technique where existing individuals recruit other possible future respondents from among their acquaintances, and so, a snowball effect may emerge with an increasing number of possible respondents (see Figure 33). This method uses effectively social networking sites (Web 2.0) for the study of "hard-to-reach" populations. This technique can expand the geographical scope and enables the identification of individuals with barriers to access, increasing the sample size and its representativeness, by using virtual networks in non-probabilistic samples (Baltar & Brunet, 2012; Browne, 2005).

Strictly speaking, the method that was used at his survey was not based on a request to the initial respondents to ask other individuals to answer the survey. Yet, the selection process at LinkedIn network also evolved as a snowball sampling. This social network organizes contacts as first conections, second, third conections and everyone else. After a connection is made between the individuals A and B, they become a first conection of each. Only a first connection shows all the information about an individual, as his email and curriculum. All first conections of individual A that are not connected with individual B are second connections of the individual B. All first conections of a

second connection of an individual are third connections of that individual. And so on. At its standard approach, the LinkedIn network restricts a direct invitation only to those that are second connections. Consequently, the more first connections there is in a personal network, the more second connections it will have too. This also works like a snowball effects, since contacts are successively added and than asked to participate in the survey.

The respondents' selection at each company was made using several steps. On a first phase, an initial set of possible individuals, working on one of the approximately two thousand selected companies, were invited to be part of my personal LinkedIn network Then, after some persons have accepted that request, others became second connections because of the recent first connections, and so, if they were eligible individuals to answer the survey, they could be directly invited to be first connections too. An important aspect of the rational of the connections at the LinkedIn social network is that when second connections are invited by someone; they can see with whom of their first connections is also connected with the person that is making the invitation. This is one characteristic of snowball sampling, since it leverages the personal communication and trust within the localized network of individuals (Browne, 2005). The snowball process continued and the number of connections was significantly incremented. This allowed the expansion of my personal network to about one thousand and five hundred individuals considered as qualified to be invited to this survey.

3.6 Research and instrument development phases

Survey instrument validation has some categories typically used in MIS (management information system) literature (Boudreau, Gefen, & Straub, 2001; Straub, 1989). The most significant categories are the pretest or pilot test. Considering those categories and taking into account some recommended guidelines (Belfo & Sousa, 2011c; Carpi, Egger, & Kuldell, 2009; Cragg et al., 2002), five phases where considered on this research in order to better validate the used instrument and its previous associated research. Among the defined phases, four of them preceded the definitive survey (see Figure 34).

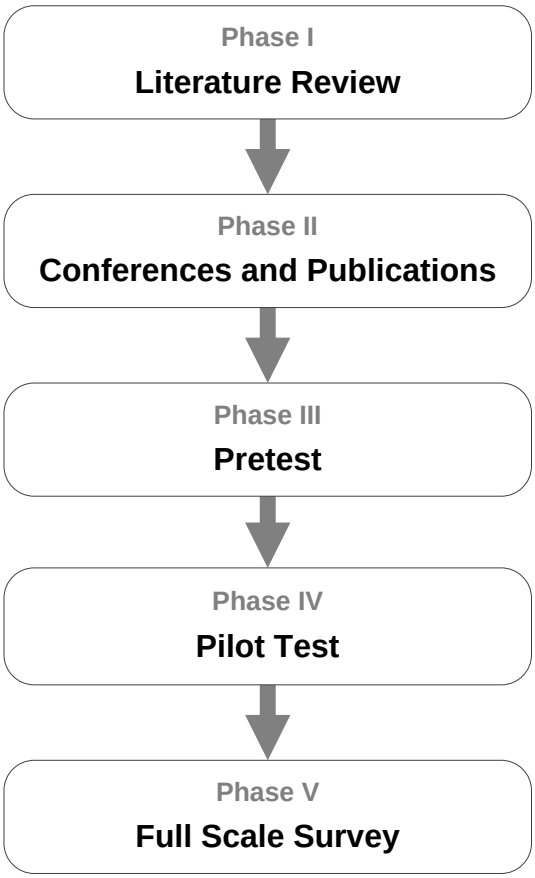


Figure 34: The conducted phases used to validate research and the survey instrument

First, there was a detailed literature review, which supported the first version of the instrument. Next, a second phase which consisted on the presentation of papers at conferences or publication in academic journals. Third, there was a phase with a pretest and forth, a phase which pilot tested the instrument. Finally, after these phases, which intended to make the definition of the instrument, its improvement and validation, as much as possible, the full scale survey was performed.

(a) Literature review phase

The first version of the instrument was supported by a detailed literature review, already resumed at the earlier correspondent chapter. The measures related with the alignment construct came mainly from the Luftman's instrument known as the Strategic Alignment Maturity (SAM). The work made by Belfo and Sousa (2013) analyzed seven other instrument proposals (Bergeron et al.,

2004; Chan et al., 1997; Cragg et al., 2002; Kearns & Lederer, 2003; Reich & Benbasat, 2000; Sabherwal & Chan, 2001; Segars & Grover, 1999) according to each dimension of BIA under SAM lenses. The six dimensions proposed by Luftman´s instrument (communications, competency/value measurements, governance, partnership, technology scope and skills) were used to analyze each instrument. This analysis revealed that Luftman's instrument seems to provide a good (and mainly strong) level of coverage of important dimensions. Five of the six dimensions got a strong level of coverage. Although reasonably well covered, the technology scope dimension was the only one that got a good level of coverage evaluation. The empirical work previously found on SAM afforded a good starting point to get an acceptable validated instrument. Indeed, SAM seems to be one of the most promising alignment instruments in terms of content validity. Yet, aspects concerning its operationalization may require more research to be done on every component of construct validity, namely, the convergent, discriminant and nomological components (Belfo & Sousa, 2013).

The selected indicators to measure the incentive construct came from different sources. An extensive literature review allowed the identification of a relevant set of motivation assessment instruments which supported the indicators of the new instrument. Those reviewed instruments were the General Causality Orientations Scale (Deci & Ryan, 1985a), the Work Preference Inventory (Amabile et al., 1994), the Harter's instrument (Harter, 1981), the Academic Motivation Scale, originally known as "Echelle de Motivation en Education" (EME) (R.J. Vallerand et al., 1992; RJ Vallerand et al., 1993), the Human Resources Survey (HR-Survey, 2011), the Work-Life Questionnaire (Wrzesniewski et al., 1997). and the Intrinsic Motivation Inventory (McAuley, 1989). Some indicators of these seven instruments were used or were adapted to be used by the instrument adopted at this research with respect to the incentive construct (Belfo & Sousa, 2011a).

(b) Conferences and publications phase

Conferences and academic journals with blinded reviewing philosophies represent an important role on the review process of any research work by peers and specialists. Although there are further mechanisms embedded within the process of science that supports the validation of the work of scientists and that a significant number of journals doesn't identify substantial paper flaws (Bohannon, 2013), the peer review still represents one of the most used. In a peer review process, comments are usually provided by reviewers regarding the validity of the methods used or the rationality of the data analysis techniques. Also, annotations may also be made about interpretations reasonableness made by the authors or and the quality of the writing (Carpi et al., 2009). According to an international survey of academics about peer review, the vast majority of respondents (85%) agreed that scientific communication is significantly helped by peer review and that without peer review there would be no control (Ware, 2008). Also, researchers prefer blind review (56% preferred double blind review and 25% single-blind) compared to other peer review formats (like open review or post publication review). Accordingly, the researcher[3] submitted and presented some papers in international conferences and

[3] The researcher main research interests are the alignment between business and information technology, knowledge management, business process management, project management, people & human factors in IT and technology innovation. On these research themes, he has made approximately two dozen publications, including book chapters, journal articles and papers presented at national and international conferences. A detailed list of publications can be consulted at https://sites.google.com/site/fpbelfo/.

published some others in journals, all of them adopting blind review principles. Table 13 (below) lists some of peer reviewed publications made by the researcher concerning subjects related to the research work.

Year	Author(s)	Publication
2010	Belfo, F.	Influence of Incentive Policy in Strategic Alignment of Information Technology and Business. Proceedings of the Conference on Enterprise Information Systems (CENTERIS 2010). Communications in Computer and Information Science, 109(5), 421-430, PA: Springler. doi:10.1007/978-3-642-16402-6_44
2011	Belfo, F. and Sousa, R.D.	Employee Incentives in IT Companies: What can we learn from Google? Proceedings of the IADIS International Conferences, Multi Conference on Computer Science and Information Systems, ICT, Society and Human Beings 2011 & e-Democracy, Equity and Social Justice 2011, 142-152
2011	Belfo, F. and Sousa, R.D.	A Web Survey Implementation Framework: Evidence-Based Design Practices. 6th Mediterranean Conference on Information Systems (MCIS) Proceedings. Paper 43.
2011	Belfo, F. and Sousa, R.D.	Developing an Instrument to Assess Information Technology Staff Motivation. M.M. Cruz-Cunha et al (Eds.): CENTERIS 2011, Communications in Computer and Information Science (CCIS), 2011, 220(3), 230-239. Springer-Verlarg Berlim Heidelberg. doi: 10.1007/978-3-642-24355-4_24
2011	Belfo, F. and Sousa, R.D.	Workforce Incentives at IT companies: the Google's Case. IADIS International Journal on WWW Internet, 9(2), 69-84.
2012	Belfo, F. and Sousa, R.D.	A Critical Review of Luftman´s Instrument for Business-IT Alignment. 7th Mediterranean Conference on Information Systems (MCIS) Proceedings. Paper 78.
2013	Belfo, F. and Sousa, R.D.	Reviewing Business-IT Alignment Instruments Under SAM Dimensions. International Journal of Information Communication Technologies and Human Development, 5(3), 18-40, July-September 2013. doi:10.4018/jicthd.2013070102
2013	Belfo, F.	A framework to enhance business and IT alignment through incentive policy. International Journal of Information Systems in the Service Sector (IJISSS), 5(2), 1-16. doi:10.4018/jisss.2013040101

Table 13. Peer reviewed publications about incentives, business-IT alignment or web surveys

Two papers resumed some of the principles enunciated on this thesis supporting the influence of an incentive policy on the business and IT alignment. One, baptized as "Influence of Incentive Policy in Strategic Alignment of Information Technology and Business" (Belfo, 2010) was presented at the 2nd Conference on Enterprise Information Systems (CENTERIS´2010) and published on its proceedings on the Communications in Computer and Information Science´s journal. The other paper, named "A framework to enhance business and IT alignment through incentive policy" (Belfo, 2013) was published on the International Journal of Information Systems in the Service Sector (IJISSS).

Also, because the chosen research method was the survey, a paper named as "A web survey implementation framework: evidence-based design practices" was presented at the 6th Mediterranean Conference on Information Systems, a conference sponsored by the Association for Information

Systems (AIS). This paper put together a set of important aspects to be taken into account through several phases of a web survey implementation. It proposed a framework developed to guide researchers in building a successful web survey implementation and is structured in terms of software tool selection, questionnaire design and survey administration phases (Belfo & Sousa, 2011c).

Furthermore, considering the two domains of the instrument, different papers were produced specifically about it. With respect to the domain of the incentives, one paper was presented in Rome on the Multi Conference on Computer Science and Information Systems, ICT, Society and Human Beings 2011 & e-Democracy, Equity and Social Justice 2011, about "Employee Incentives in IT Companies: What can we learn from Google?" (Belfo & Sousa, 2011b). This paper, which received an award as been considered among the best papers of this conference, presented an interesting case about employee incentive policies in IT companies. Using a netnographic approach to look into a work life blog discussion with the participation of present and past Google employees, a total reward strategy framework is used to analyse the data and generate new insights. Later, based on this paper, another one, named "Workforce Incentives at IT companies: the Google's Case" was produced and published on the journal IADIS International Journal on WWW Internet (Belfo & Sousa, 2011d). With these two paper major contributions, another paper was made, called the "Developing an Instrument to Assess Information Technology Staff Motivation" and reporting on the development of an instrument designed to measure the motivation of Information Technology people at their workplace. Psychology theories and work addressing intrinsic and extrinsic motivation have been studied. Some motivation instruments were reviewed and analysed. Specificities and special characteristics regarding IT workers were evidenced and combined with other more general motivation factors (Belfo & Sousa, 2011a). This last paper was the basis to the part of the instrument concerning the incentives. The selected indicators to measure the incentive construct came from different sources. The instrument proposed by Belfo and Sousa (2011) was developed according to the five dimensions of the Worldatwork framework, resulting in a set of scale items addressing several variables (WorldatWork, 2008).

With respect to the alignment domain, a paper named "A Critical Review of Luftman´s Instrument for Business-IT Alignment" (Belfo & Sousa, 2012) was presented on the seventh Mediterranean Conference on Information Systems (MCIS). Among many proposals about alignment, one of the best known and cited in the literature, showing some relevant empirical work, is the Luftman's Strategic Alignment Maturity (SAM) assessment. So, taking it as a framework, this paper presented the examination of this and seven other proposals using the components of the SAM assessment: communications, competency/value measurements, governance, partnership, technology scope and skills. Moreover, on the sequence of this paper, another one, called "Reviewing Business-IT Alignment Instruments under SAM Dimensions" (Belfo & Sousa, 2013), was published on the International Journal of Information Communication Technologies and Human Development. Since this work evidenced that Luftman's instrument is one of the most used, promising and acceptable instruments to measure the alignment construct, this instrument was the basis to the part of the instrument used on this research concerning the alignment.

(c) Pretest phase

The third phase of the instrument development was supported by a pretest. As usual, this pretest was considered a preliminary trial of some aspects of the instrument to ensure that there are no unanticipated difficulties (Boudreau et al., 2001). This pretest, a small-scale trial of particular research components, was conducted to successively refine the instrument with the collaboration of some experts. The techniques used at pretesting aim to identify non-sample errors, proposing ways to improve or reducing those errors occurrences (Australian Bureau of Statistics, 2001).

(c.i) Approach of the pretest phase

With the objective of locating and correcting weaknesses in the questionnaire instrument, personal interviews were conducted with 11 participants. Below, Table 14 presents the demographic profiles of the experts which participated at the pretest.

Feature	Number	Percentage (%)
Role		
Practitioner	4	36,36
Researcher	7	63,64
Education		
Doctoral	5	45,45
Master	3	27,27
Bachelor	3	27,27
Specialty		
Information Technology	6	54,55
Human Resources	3	27,27
Linguistic & Law	1	9,09
Business	1	9,09

Table 14. Demographic profiles of the experts participating at the pretest

The in-deep interviews with the respondents offered insight into the alignment problem and about what could be the influence of certain incentives on it. The experts were supposed to comment and evaluate the instrument in the same language that it will later be used to answer by the final respondents. So, before interviewing the experts, the questionnaire was previously translated into Portuguese.

In order to establish a high degree of equivalence at the translations of the survey instrument and according to best practices, differences between English and Portuguese languages were taken into consideration and occasionally, some cultural appropriateness (Davidov & De Beuckelaer, 2010). Some specific aspects were taken into account in order to adequate the survey instrument translation. These aspects were the equivalence in meaning and content (conceptual equivalence), the equivalence in grammar and syntax (technical equivalence), the readability and comprehensibility for the target population (linguistically appropriateness) and occasionally, the attention to cultural assumptions, norms, values, or expectations of the target population (cultural competency).

Acknowledging the importance of cultural and conceptual equivalence need in a survey translation, significant time and effort was invested in the translation process. In order to get a proper translation and adaptation of measures, a fluent bilingual in English and Portuguese languages, a native speaker in Portuguese and with a nearly equal fluency in English (a logical consequence of having lived and worked in the USA during a significant number of years), was also invited to review the translation. Her comments were adequately taken into consideration.

The Appendix 3 presents the Portuguese version of the instrument, the one which was effectively used at pretest phase. The Appendix 4 presents the Portuguese version of the instrument, after the changes made in consequence of the pretest and which was used at pilot test phase. Some words or expressions are underlined at Appendix 4 to make visible the changes that were made through this process.

The design of the interviews considered an evolution from an open-ended to a highly structured format (Straub, 1989). The interviews had three sequent segments (see Figure 35). The first segment consisted in interviews conducted in an open-ended general discussion format. Secondly, interviews gradually moved to a semi-structured format and lastly, they moved to a highly structured analysis of each item of the draft instrument.

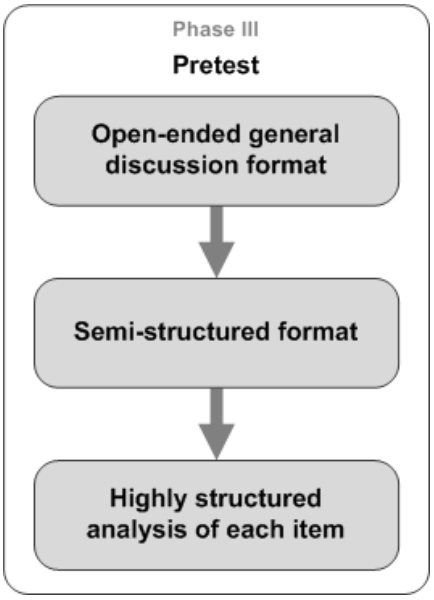


Figure 35: The three sequent segments adopted in the interviews design of pretest phase

Each interview started by introducing the subject of the research and encouraging the participants to be discursive. They were provoked by a simple request for their opinion about the importance and characteristics of the alignment between business and IT and about incentives. Participants were also asked about the possible influence of incentives on the alignment. The general perception of the interviewees was that incentives should influence the alignment. When asked about the main characteristics of the alignment and incentives (content validity), interviewees' suggestions about these constructs were, essentially, already considered on the design of the presented instrument.

Secondly, in the semi-structured segment, questions from the interviewer focused on the proposed dimensions of the alignment and the incentive. Clarifications about the constructs and their dimensions were undertaken in this segment (content validity). Interviewees were also asked if the proposed questions actually measured part of each construct (construct validity).

The Appendix 2 presents the English version of the instrument presented to these participants. Yet, as it was previously mentioned, since the universe is composed of Portuguese companies and the native language of the respondents is Portuguese, the questionnaire was translated into Portuguese and answered in that language.

On one hand, participants were highly challenged to propose changes to questions in order to better capture a property of a construct. On the other hand, interviewees were also asked about the clarity of the research questions. They were encouraged to propose an alternative formulation of a question if they feel it could be better understandable. The accepted changes on items tried to ensure a better correspondence and isomorphism between the syntactic and the semantic form of linguistic expressions. Some changes needed a deeper reflection, others, more obvious, are supposed more commonly accepted and were almost immediately adopted.

The conversations with the experts were very enriching, not only by qualitative contributions that were immediately expressed either by the successive incremental improvements that have happening over the exchange of views with the expert and, also later, after a more careful analysis of the issues, timely and briefly noted.

This section is organized as follows below. Firstly, there are some generic change proposals that are presented. The reason why these changes appear on first is because the rationale behind this type of changes affects not only one item, but a group of items. So, the first adjustments to be discussed are about items related with issues like the reverse coding and the results of the content validity ratio test which was previously made. Secondly, the results of the content validity ratio test are analyzed. And third, each item that was challenged by an expert is analyzed. The order of this last analysis is the same order the items have on the instrument. Each challenged item is discussed and a decision is made and presented about each one wording.

(c.ii) Reverse coded items

Three of the items were initially reverse coded (item I04, I14 and I21). The original objective of this procedure was to force respondents to pay attention to the questions before answering. At the proposed instrument, only a short number of questions were worded such that high values for the construct are valued by low scores on the item. For example, the following example is a translation of the item I14 of the initial instrument using this reverse coded procedure:

"It is difficult for me to get time off because of maternity/paternity or sabbatical reasons"

The original idea consisted on inverting the answers on this kind of items. The selected option (one of the five options, from 1 - "strongly disagree" to 5 - "strongly agree"), should be converted into precisely its symmetric value.

Although the reverse coding may have some benefits and so, it has a significant number of supporters, there are also some problems with this approach. Several interviewees manifested that reverse coding could confuse respondents. As a matter of fact, the use of negatively worded and consequently reverse-scored items is not consensual and has motivated abundant debate. It has strong supporters and opponents. On one hand, supporters argue that reverse-scored items may reduce response set bias. On the other hand, opponents argue that the usage of few of reverse-scored arbitrarily distributed within a measure may have a damaging effect on psychometric properties of a measure (Hinkin, 1998). Because some interviewees believed that negatively worded items may create confusion, and since it seems this approach has pointed out problems with internal consistency, factor structures, and other statistics (Barnette, 2000; Eys, Carron, Bray, & Brawley, 2007; Roszkowski & Soven, 2010), it was decided to convert the negatively worded items into positively worded items.

(c.iii) Content validity test

Content validity may be defined as the degree to which items in an instrument reflect the content universe to which the instrument will be generalized (Straub, Boudreau, & Gefen, 2004). Content validity shows that a sample of the universe in which the investigator is interested is covered by the test items (Cronbach & Meehl, 1955).

Straub (1989) summarizes the content validity concept with the following question:

Are instrument measures drawn from all possible measures of the properties under investigation?

Figure 36 presents a symbolic model of the content validity of an instrument. It considers that the domain of a given construct can be represented by a circumference and that an instrument tries to measure the most important properties of the concept, by using several items to do it. Each item of the instrument represents one point on the universe of all possible measures of the concept and captures a fragment of it.

Literature review and expert judges or panels are typically employed to established the content validity (Straub et al., 2004). As it was suggested by Cronbach (1971) (as cited in Straub et al., 2004), a review process should involve experts in the field, familiar with the content universe, that evaluate versions of the instrument again and again until a form of consensus is reached.

However, according to the proposal of Cronbach (1971), even before this review process involving experts, a detailed literature review should be the first step to try to ensure a good content validity right on the first version of instrument.

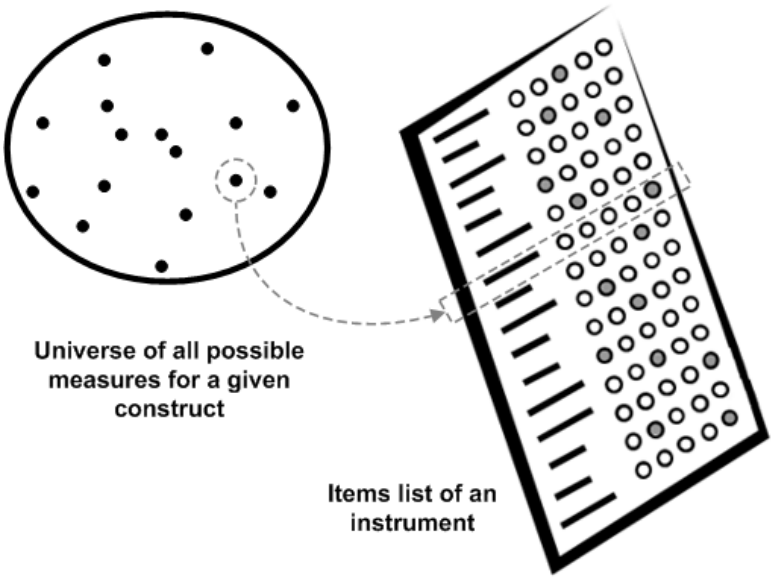


Figure 36: A symbolic model of content validity of an instrument
Source: Adapted from Straub et al. (2004)

Also following Straub (1989) suggestions about content validity, a series of pre-tests were conducted with the help of a panel of several experts. According to Straub suggestions, different groups of experts were sought and used. The heterogeneity of knowledge and experiences among the experts enriched the global feedback and it increased the probability of find possible validity problems or just getting simple improvements to the instrument. Interviewees, each one with its own personality, background and culture, came from a variety of organizations. Some of these experts came from the IT area, more oriented to the IT and the alignment domain and others are specialized at human resources and are more geared to the field of incentives. Some others, considered as linguistic experts, were more focused on the general clarity of the domain definitions (Fitzpatrick, 1983). These last experts were more focused on the interpretation of the questions and the cognitive processes undertaken in answering the questions or on the reduction of the interviewer effects, arising from the interviewer's ability to consistently deliver the questions as worded, and so, improving or minimizing the occurrence of those errors (Australian Bureau of Statistics, 2001).

Interviews were designed to move progressively from an open-ended general discussion format, to a semi-structured format, and finally to a highly structured item-by-item examination of the draft instrument. At the final stage of the pre-test, each interview moved to a structured item-by-item examination of the draft instrument. Experts were invited to classify the content validity of each item. After collecting those specific item validities, it was possible to compute a content validity ratio (Straub et al., 2004). The used method to compute a content validity ratio (CVR) was based on another study with a similar validity approach (Lewis, Snyder, & Rainer Jr, 1995). This method is used as a way to measure the extent to which items in a tool sample the complete range of the attribute under study (DeVon et al., 2007). It was based on the one proposed by Lawshe (1975), where all experts responded to each activity item's relation with its correspondent concept (the alignment or the incentive) on a three-point scale: "1 = not relevant"; "2 = important (but not essential)"; "3 = essential".

The CVR was computed for each item using the formula presented at Equation 4.

$$CVR = \frac{n - \frac{N}{2}}{\frac{N}{2}}$$

Equation 4: Content validity ratio (CVR) computation

At Equation 4, the variable n is the frequency count of the number of panelists rating the item as either "3 = essential" or "2 = important (but not essential)" and N is the total number of respondents. Contrary to Lawshe´s suggestion, which only employed the "essential" response category in the computation of the CVR, the present study follows the approach of Lewis, Snyder and Rainer, with a less rigid employed criterion, considering both "essential" and "important" classes. Either the "essential" or the "important" responses were used because they were positive indicators of the items relevance to the constructs under evaluation.

The CVR for each item was evaluated for statistical significance (with an alpha level of .05). This significance is interpreted as more than 50% of the panelists rate the item as either essential or important (Lawshe, 1975).

Number of panelists	Minimum Value of CVR
5	0,99
6	0,99
7	0,99
8	0,75
9	0,78
10	0,62
11	0,59
12	0,56
13	0,54
14	0,51
15	0,49

Table 15. Minimum Values of CVR (one tailed test, p ≈ 0.05), adapted from Lawshe (1975)

The content validity has a greater extent as more panelists recognize each item as “essential” or “important”. The Table 15 presents the list of minimum values of CVR (one tailed test, p ≈ 0.05), according to the number of panelists (Lawshe, 1975). As there were 11 panelists, the minimum value considered for CVR should be 0,59.

Table 16 and Table 17 present content validity ratios (CVR) of each incentive and alignment survey items, respectively, with the correspondent measured (or manifested) associated variable. The Appendix 6 presents their detail computation. This accounting was made and two items did not meet the minimum value of CVR correspondent to the number of panelists who participated. Taking into account each expert classification about each item, the computation of the content validity ratio for each item was made.

Item Number	Measured (Manifested) Variable	1 Not necessary	2 Useful, but not essential	3 Essential	CVR (Content validity ratio)
I01	Base Wages	0	3	8	1,00
I02	Premium Pay	0	5	6	1,00
I03	Variable Pay	0	2	9	1,00
I04	Legally Required	0	3	8	1,00
I05	Health & Welfare	0	4	7	1,00
I06	Retirement	2	4	5	0,64
I07	Performance	0	0	11	1,00
I08	Performance	0	2	9	1,00
I09	Job Assignment	0	0	11	1,00
I10	Job Assignment	0	1	10	1,00
I11	Recognition	0	1	10	1,00
I12	Workplace Flexibility	1	6	4	0,82
I13	Workplace Flexibility	0	2	9	1,00
I14	Paid & Unpaid Time Off	0	3	8	1,00
I15	Health and Wellness	1	4	6	0,82
I16	Community Involvement	0	5	6	1,00
I17	Community Involvement	0	6	5	1,00
I18	Caring for Dependents	1	3	7	0,82
I19	Financial Support	0	5	6	1,00
I20	Voluntary Benefits	1	3	7	0,82
I21	Team work and diversity	0	1	10	1,00
I22	Culture of listenning	0	1	10	1,00
I23	Workplace Stability	0	1	10	1,00
I24	Available Equipment & Data	0	2	9	1,00
I25	Learning Opportunities	0	1	10	1,00
I26	Coaching / Mentoring	2	2	7	0,64
I27	Advancement Opportunities	0	4	7	1,00
I28	Challenging problems or situations	0	3	8	1,00

Table 16. Content validity ratios (CVR) of survey incentive items

According to these calculations, all the items exceed the minimum required. If there were some items that did not reach the minimum, they should be dropped (Lewis et al., 1995) or, at least, reworded. Although the items I06 and I26 were not below the required minimum, as they were near that minimum, it was decided that it would be better if they were substituted by completely new or reworded ones.

Item Number	Measured (Manifested) Variable	1 Not necessary	2 Useful, but not essential	3 Essential	CVR (Content validity ratio)
A01	Understanding of business by IT	0	0	11	1,00
A02	Understanding of IT by business	0	2	9	1,00
A03	Organizational learning	0	0	11	1,00
A04	Style and ease of access	0	2	9	1,00
A05	Leveraging intellectual assets	0	0	11	1,00
A06	IT–business liaison staff	0	3	8	1,00
A07	IT metrics	0	2	9	1,00
A08	Business metrics	0	1	10	1,00
A09	Link between IT and business metrics	0	0	11	1,00
A10	Service level agreements	0	0	11	1,00
A11	Benchmarking	0	3	8	1,00
A12	Formally assess IT investments	0	3	8	1,00
A13	Continuous improvement practices	0	0	11	1,00
A14	Formal business strategy planning	0	0	11	1,00
A15	Formal IT strategy planning	0	2	9	1,00
A16	Organizational structure	0	1	10	1,00
A17	Reporting relationships	0	3	8	1,00
A18	How IT is budgeted	0	2	9	1,00
A19	Rationale for IT spending	0	4	7	1,00
A20	Senior-level IT steering committee	0	0	11	1,00
A21	How projects are prioritized	0	0	11	1,00
A22	Business perception of IT	0	2	9	1,00
A23	IT's role in strategic business planning	0	1	10	1,00
A24	Shared risks and rewards	0	1	10	1,00
A25	Managing the IT–business relationship	0	1	10	1,00
A26	Relationship/trust style	0	2	9	1,00
A27	Business sponsors/champions	0	3	8	1,00
A28	Primary systems	0	3	8	1,00
A29	Standards	0	3	8	1,00
A30	Architectural integration	0	1	10	1,00
A31	Infrastructure transparency	0	3	8	1,00
A32	Infrastructure flexibility	0	3	8	1,00
A33	Innovative, entrepreneurial environment	0	0	11	1,00
A34	Key IT HR decisions made by:	0	2	9	1,00
A35	Change readiness	0	0	11	1,00
A36	Career crossover opportunities	0	1	10	1,00
A37	Cross-functional training and job rotation	0	2	9	1,00
A38	Social interaction	0	3	8	1,00
A39	Attract and retain top talent	0	0	11	1,00

Table 17. Content validity ratios (CVR) of survey alignment items

This research calculated a content validity ratio test of all items taking into account the analysis of the items made by each expert. This test is explained further ahead. Although that test revealed that

all items have resisted to the content validity ratio test, there were two items with the lower content validity ratios that may deserve a more careful analysis and probably be reworded or removed; item I06 and item I26.

The wording of item I06 presented at pretest phase was the following:

I feel the retirement benefits offered by my company meet employees needs

Some experts questioned about the adaptability of this aspect to the Portuguese reality. According to the Portuguese public institute of social security, the official retirement benefit is a cash support paid to persons aged equal or higher than 66 years (2015) that have discounted for at least 15 years for the Portuguese Social Security. All employed persons (workers on behalf of others with a labor contract), members of statutory bodies of legal persons (directors, and managers administrators), self-employed workers (green receipt) and the beneficiaries of Voluntary Social Insurance that have accomplished those two previous conditions have the right to get a retirement pension (Centro Nacional de Pensões, 2015). Even special professions, like miners, dancers or air traffic controllers, have the right to have a public retirement benefit. The only differences with these jobs are the access conditions (age and number of years of discounts), which are different from the general regime.

In fact, as it was said before, Portugal differs from other countries like the United States of America (USA) or United Kingdom (UK) in terms of retirement benefits. Unlike those countries, with popular private schemes, consisting of financial plan arrangements set up by employers, insurance companies, government, or other institutions, the most important and almost unique regime for many years in Portugal, paid by employers, was the public retirement benefit, which is characterized by rigid rules and benefits. Also, contrary to Portugal, in USA and other countries, retiree health benefits constitute specific benefits extremely important (OPM, 2014). In Portugal, retirement plans have been also common, but usually paid by employees. That fact could be the reason why some experts demonstrated some caution about the item I06. Nevertheless, recently, with potential future problems around the sustainability of the public social security, some insurance companies increased their offer in Portugal within these types of insurances, and these benefits are increasing their adoption in this country. Consequently, although it was considered useful to include an indicator about retirement benefits, it was decided that this item should be adapted to the Portuguese reality, not generically talking about retirement benefits, which could include benefits not usual at Portugal, but specifically referring just to retirement savings plans. The new wording of item I06 became:

My company offers me a supplementary retirement savings plan that I like

Although the item I21 has already been proposed to be changed because of the cancellation of reverse coding, there was another comment about the translation of this item from an expert. Yet, although the word “diversity” meaning has been questioned, the translation was correct and the wording remained the same.

The item tagged as I26 has its wording at pretest phase as the following:

My supervisor is an effective role model for me

This item, also proposed by Belfo and Sousa instrument was supposed to measure the coaching/mentoring manifested variable, supporting the latent variable about development and career opportunities (Belfo & Sousa, 2011a; HR-Survey, 2011). However, in fact, the WorldatWork incentive model (WorldatWork, 2008), here adopted, do not really focus on the importance of the ideal model that a supervisor can symbolize. As it can be seen in Appendix 7, the coaching/mentoring variable may embrace leadership training, exposure to resident experts, access to information networks, formal or informal coaching or mentoring programs. The netnography study made by Belfo and Sousa (2011b), where a work life blog discussion with the participation of present and past Google employees was analyzed, revealed that the opportunity to brainstorm with smart people is commonly appreciated by those employees. Yet, item I26 pointed to an excessively restrictive idea that a supervisor should be the model to follow by the employee. Indeed, according to the UK Commission for Employment and Skills (UKCES), coaching/mentoring is normally a short-term/long-term process where a more experienced colleague uses their knowledge and experience to support the development of a more junior member of staff (Bentley, 2012). It does not mention that it has to be the employee's supervisor. Accordingly, taking that idea in mind, another wording to I26 item is proposed:

I have the opportunity to work with experts and experienced people who represent role models and inspire me in my work

(c.iv) Contributions of the expert's interviews

The item numbered as I01 raised comments from one of the experts.

> *"I receive fair base wage for my job compared to others doing similar work at other companies"*

This expert, an experienced professional in labor law, taking into consideration the assumptions about compensation outlined at the Portuguese labor code (2012), considered that this item would better capture the global concept of salary if it just said "wage" (or salary) instead of "base wage". This proposal was justified with the interpretation of article number 258 of the labor code, which supports that an employee salary, besides base wage, also includes regular and periodic payments. This was a correct and very pertinent comment. Yet, the idea of this item is precisely the capture of only the base wage part of the entire wage. The following items of the instrument, I02 and I03, will try to capture the other aspects about the wage concept. By doing this, the contribution of wage to the incentive's universe will be better covered by the test items and so, it will increase the content validity (Cronbach & Meehl, 1955).

Nevertheless, the item I01 was changed due to another reason. This item is supposed to help to measure the degree of satisfaction of respondent about his base wage. Yet, the word "fair" may cause problems. If the respondent thinks he is overpaid, comparatively to the market, which means that he is receiving much more than others doing a similar work at other companies, he may disagree and the answer is biased according to what it is supposed to measure. The idea is to measure how good is a base wage of an employee, nevertheless, taking into account the market average payment. So, another description is proposed to item I01 in order to avoid this possible problem:

> *"I receive a good base wage when compared with others doing similar work at other companies"*

The second item about compensation, the item I02 described below, also raised some questions from some experts. Its proposed description at pretest was:

> *"My company offers a generous premium increases in payment for on-call work or valued special skills"*

The wording of this item was focused on premium payments for on-call work. The on-call working happens when employees are required to be at a location nearby, so that, if called, they can be reached and be available to return to work immediately. For this extra work, the employee receives an overtime payment. Yet, the on-call work situations are more common at manual works. Although there can be on-call circumstances with white collar workers, the on-call work is more widespread in situations where there are extra needs of work, justified for example by unexpected greater demand from customers or by the need of substitution of a colleague that suddenly went sick and that can be replaced by the other employee without major difficulty.

The incidence of overtime payments is far higher among blue collar compared to white collar workers. Almost all manual workers are eligible for paid overtime in contrast to non-manual staff. Most companies stops paying for overtime among non-manual staff when they reach specified salary levels. These may justify some studies that show low percentages of white collar workers which were paid for overtime work in contrast to almost half of plant and machine operatives paid for overtime (Hart & Ma, 2010). Usually, this phenomenon is justified because blue-collar workers often work alongside colleagues who have the same or very close skills. Their type of expertise is much less specialized than white-collar workers. Also, the reward and effort are comparatively more observable within manual work environments than in more knowledgeable or managerial occupations. Consequently, as the respondents of this study are white-collar workers, other types of supplementary compensations besides the overtime are more common, as those due to availability to flexible working, where employer allows the employees have a certain degree of freedom to decide how their work will be done and how they will coordinate their schedules, or as those due to valued special skills and consequent quality of the work done. These considerations justified the change of the wording of item I02 to:

"My company offers me an extra compensation for my flexible working or the merit of my work"

The item numbered as I03 also justified comments from other experts. An expert said the expression "largely exceed the objectives" at the descriptor of the item below, could be interpreted differently by the respondents:

"I am pleased because I'm earning more for what I do if I exceed the objectives"

His suggestion was to change "largely" to "clearly". The justification to this proposal was that the meaning of "largely" is probably different from person to person, and that "clearly" word may reduce this possible problem. The raising of this issue was important. Indeed, one of the rules that should be followed in designing Likert statements, previously presented, is that questions should avoid quantitative statements (Johns, 2010). This rule states that adverbs like "always" or "better" should be avoided, because they cause problems by introducing ambiguity into discordant responses. The adverb "largely" and even "clearly" may also have the same effect, so, the decision was its removal from the item description.

Item I03 may also violate the best practice about writing Likert statements that states questions should not contain two attitude objects (Johns, 2010). The first is about the satisfaction of the respondent and the second is the fact that he is earning more for what he/she does. If a respondent answers disagreeing with the statement, he may want to say that he is not pleased or that he is not earning more money. Another different thing would be to question the employee about his satisfaction relative to the possible extra recompense he would receive if he exceeds the objectives. Lastly, there was one expert that said there was no specific item to measure incentives like the stock or option compensation possibility. However, the idea is to use the item I03 to embrace, not only this particular type of payment, but any type of extra remuneration defined accordingly to previously defined objectives, set under different types of schemes, like "quota-based", "tournament", "fixed-rate" or other

programs, which may be the result of combined programs (Stolovitch et al., 2002). Consequently, the wording of item I03 was changed and simplified to:

"The additional compensation which I may earn if I exceed my objectives satisfies me"

This new wording of item I03 also takes into account the balance made by the employee about the probability of having an additional compensation and that reward's value for him. This is aligned with the expectancy theory, which states that someone's degree of motivation depends on the attraction of rewards proposed and the probability of obtaining those rewards (Jiang et al., 2009).

The item I04 referred to legal obligations benefits:

"I feel my company does not meet legal obligation benefits to each employee"

However, two experts denoted that legal obligations should be always met and so, this kind of item would not make sense. In a country where the normality is to fulfill the laws, a significant incentive is something given or made available beyond the duties of the organization. So, if an incentive (or an inducement) is usually designed in order to encourage a specific behaviour, only non-compulsory benefits should be questioned in the survey. The benefit's construct considered in this research is the fringe benefits concept, not including benefits as the surplus that the employee receive for his work at night or at the weekends, because it fixed by law and is a right for all the workers (Janssen et al., 2007). Consequently, the item I04 was substituted by another one.

As it was previously said, one common and important benefit to white-collar employees is to provide a company car to employee's private use and, possibly, other related benefits as fuel, maintenance or car wash services. As on other items, the wording of this item should allow the respondent to graduate his answer according to the level of benefits and corresponding satisfaction. The new I04 item wording focused on that issue:

"I'm happy with the car and related benefits provided by my company"

One expert underlined that the items tagged as I05 and I15 are very similar, both trying to capture health and welfare incentives. The first one is part of the set of items of the benefit's construct and the second is under the work-life construct. The idea was to follow the WorldatWork's incentive model proposal, supporting that there can be these two different dimensions of health and welfare incentives. Yet, as we know, sometimes is difficult to distinguish the frontier between those two constructs.

As it was previously explained, on one hand, benefits are programs used to supplement the cash compensation that employees receive, usually designed to protect the employee and his or her family from financial risks and can be categorized into social insurance, group insurance and payment for time not worked. On the other hand, work-life consists in a specific set of organizational practices, policies, programs, combined with a philosophy which actively supports efforts to help employees achieve success either at work or at home (WorldatWork, 2008). These two definitions clarified the

frontier between the two constructs. So, accordingly, the item I05 could be focused on the insurance side of health, removing the reference to "other health or welfare benefits" that could cause confusion, and the item I15 could be dedicated to health or wellness initiatives and services.

Also, even if they are very similar, there are some differences between a health insurance and a health plan that deserve to be underlined. In short, although both have the sole purpose of protecting the insured person against the health costs that arise, the health insurance allows the reimbursement of medical and hospital expenses, allowing the employee to freely choice doctors and hospitals that he wants to attend, while that does not happen in the health plan. The health plan's logic is to ensure that all health services that will be needed will be available free of charge, in the various hospitals, clinics and laboratories previously defined in the plan (Henriques, 2014). Therefore, the item I05 wording was changed to:

"My company offers health plans or insurances to ensure my needs"

As it was previously said, latent variables should have at least three indicators in order to reduce bias (Iacobucci, 2010). Although the variable "benefits" has three indicators, if one of them is dropped ahead, when the measurement model is assessed, then the variable may have lack of indicators. Accordingly, some new indicators were thought to minimize that possibility.

Belfo and Dinis proposed that benefits latent variable could include an item about the payment for time not worked (Belfo & Sousa, 2011a). Their measure description proposal for it was:

To me, it is very important the company payment for time not worked, like when I get sick or by other weighty reasons

A new item was added to the instrument based on that previous item. It was reformulated taking into consideration that the general objective of this instrument is measure the opinion of respondents about their firm with respect to each item and not about the importance of each item abstractly. The reformulated and new candidate is the following item I29:

In special situations, like when I get sick, my company typically does not discount and paid me for the time not worked

One expert said that other types of benefits should be mentioned, like the usage of a company car or a mobile phone. Indeed, as it was previously pointed out, there are a huge number of these type of benefits, typically oriented to white-collars employees, usually called non-cash fringe benefits (Janssen et al., 2007). The importance of using a company car may justify autonomy of that benefit, questioned by the new reworded item I04. Some other most important non-cash fringe benefits, like the usage of a credit card, event tickets, voucher offers or the usage of a mobile phone or a computer are a very common practice to pay for private employee expenses and definitely, also deserve a new item. The new item I30 refers to the more common benefits, not yet questioned in the instrument, as follows:

"I am satisfied with benefits for personal use, such as credit card, event tickets, vouchers, mobile phone or computer usage"

The writing of item I07 evoked comments from one of the experts. He said that "objectives" should be replaced by "performance". He argued that, although these concepts are related, they are different, and that what should be measured is the performance and not the objectives. The original English version of this item was the following:

"I understand the measures used to evaluate my objectives"

Indeed, the nature of the relation between the objectives or goals definition and the performance has been widely explored by the psychological literature (Barrick et al., 1993; Jiang et al., 2009; Locke & Latham, 2002; Locke et al., 1981; Lunenburg, 2011; Sonnentag & Frese, 2001). For instance, it has been widely accepted that specific challenging goals lead to higher performance than easy goals, like when it is just asked to "do your best" (Locke et al., 1981). This higher dependency of goals setting on performance is particularly evident among employees with certain type of personality traits, as conscientious individuals, which seem to be more likely to set goals and are more likely to be committed to those goals (Barrick et al., 1993).

Consequently, if objectives are well defined and clearly understood, this will contribute to help to define a better instrument to measure the outcome and consequent rewards. Yet, it is obvious that it would be better to separate these two concepts. Two different items should be considered. One item to measure the specificity and the assignability of the objectives and, another one, capturing the clarity of the criteria underlying the instrument used to evaluate performance, undoubtedly dependent of the measurability of objectives. The item I07 could capture this last concept.

The same expert also believed that instead of saying "measures", it would be better if it was said "criteria". As a matter of fact, relevant actions for organizational goals are those that create performance and so, one needs criteria for evaluating the degree to which an individual's performance meets the organizational goals (Sonnentag & Frese, 2001). And, although employee performance appraisal should consider criteria with a measurement approach, using simple quantitative performance indicators, there may be some common white-collar jobs, like the creativity or some IT jobs, that can have more difficulty in measuring performance (Hakala, 2008). Indeed, methods of assessment of individual job performance may be distinguished from types of criteria. They can be broadly classified into organizational records and subjective evaluations (Viswesvaran, 2001). So, both suggestions from this expert were accepted and so, it would be more flexible and preferable, that item I07 adopts the following new redaction:

"I understand the criteria used to evaluate my performance"

Also, a good specification of goals is crucial so it positively affects motivation and performance. The S.M.A.R.T. goal system, which was initially proposed and later updated by Kenneth Blanchard and Spencer Johnson, sustains five goal's essentials and conditions, each one associated with one letter of

the acronym SMART. First, the goals must be specific ("S") so they can be translated into motivation and improved performance. Second, they must be measurable ("M") in order to be able to provide progress feedback and know when they are achieved. Third, a goal must be assignable ("A") to an individual or a group. Fourth, although a goal must be challenging, it also must be realistic ("R"). And fifth, in order that goals can positively affect motivation and performance; they must be time-related ("T") (Redmond & Padgett, 2014).

Although the measurability of the objectives and consequent criteria could be captured by item I07, there are other important characteristics which should be captured. One new item could capture the specificity, assignability and, perhaps the time-related characteristics of the objectives. This objective could probably be fulfilled with this new item:

"The goals assigned to me have their scope and period explicit"

Although the item I09 was not challenged, it was suggested by some experts that it could be part of a new category of the incentives. The name of this new category could be called "realization" (achievement or fulfillment).

Furthermore, the items I10 and I23 seem to measure almost the same thing. The item I10 assesses the effectiveness of the job assignment according to personal skills and the item I23 assesses the stability of the same job assignment along the time. So, it was decided to substitute the item I10 by the above proposed description.

One expert suggested the change of the item I11 translation to Portuguese. Yet, a more important comment was made by another expert, which underlined the importance of valuing the recognition not only of the individual contribution, but also of contribution of the team. As it was presented before, the "performance and recognition" should promote the alignment of the organizational with individual performance assessment, but also with team performance (WorldatWork, 2008). So, the suggestion made was accepted. Its new wording was the following:

"My company recognizes the contribution that I or my team gives"

Another change's proposal was relative to item I12. Its pre-test wording was as follows:

"My current position permits me to experience the chance to do things my own way and not to be constrained by rules of an organization"

Yet, an interviewed expert said the item should directly reference the organization of the survey respondent. Also, this item may violate the "double-barrelled" rule in Likert statements, previously presented. The word "and" may evidence two statements. By using a "double-barrelled" question like the one proposed above, stating by one hand that "do things my own way" and on the other hand "not to be constrained by rules of an organization", it is potentially asked about two different attitudes (Johns, 2010). Furthermore, every organization has some rules, which usually constrain the behaviour

of all employees. Consequently, the second part of the item numbered as I12 is discarded and its wording became the following:

My organization permits me to experience the chance to do things my own way

The item I13 was also challenge. Its initial wording was:

I can arrange my work schedule to meet my personal and/or family needs

An expert stated that is very unusual an employee being completely autonomous to define his work schedule. He argued that, normally, although an organization may authorize certain employees to outline a schedule, an employee doesn't have complete freedom to define it and this definition has to obey to certain limits and it may depend on the specific circumstances. This item tries to measure the flexibility of the working schedule. Indeed, usually, there are some different practices about the flexibility of the working schedule (compressing the work weeks, defining flexible daily hours, flexplace or time banks), but all of them have some rules.

Indeed, the item description of I13, came from a proposal of Belfo and Sousa (Belfo & Sousa, 2011a), originally coming from the Employee Attitude Survey (EAS) developed by Human Resources Survey (HR-Survey, 2011), suggested the word "arrange" to explain the context of a defining process of an employee of his own work schedule. Yet, "arrange", depending on the context, may mean similar, but different things, like: organize, fix up, get, plan, work out, prepare, make, do, process, straighten out, conciliate, harmonize, compromise, agree or accommodate, among others. Here the context of "arrange" should be semantically similar to conciliate, harmonize or accommodate and not fix up, prepare, make, do, or process, words disclosing a much more independent and not necessarily conciliatory decision from the employee side. Concluding, the question raised by the expert could be easily solved by changing this word "change" to another one reflecting the intended meaning so there are no misunderstandings. So, the item I13 was changed to:

I can conciliate my work schedule to meet my personal and/or family needs

Although the item I14 was already proposed to be changed, due to the cancellation of its reverse coding, another expert referred that the motive of an employee to get time off could be more comprehensive. Previous description was:

"It is difficult for me to get time off because of maternity/paternity or sabbatical reasons"

The expert said that including not only maternity/paternity or sabbatical reasons but also the family support in general could make the item more inclusive. Indeed, on one hand, the objective of the item I18 is specifically questioning about dependent caring for dependents, and, on the other hand, the item I14 contains two attitude objects (leaves due to either maternity/paternity or sabbatical reasons), conflicting with one of the best practice about writing Likert statements. Furthermore, the item I25, which objective is to specifically question about learning opportunities, could refer not only to

opportunities for increasing knowledge and skills at the work, but to opportunities provided by the company in general, which can possibly include sabbatical dispensation.

Consequently, the expert suggestion about the item I14 was accepted and it should generically ask about time off, which could vary among various possibilities as illness, family, dependents, emergency, to move house, to attend a wedding, to visit a sick person or other personal reasons. The suggested item should generically refer to "personal commitments and emergencies" and so it will be:

"It is easy for me to get time off because of personal commitments and emergencies"

Accordingly, the item I18 will remain unchanged.

There was a slightly change proposed to item I15 by one expert. Its pretest wording was:

My company offers health or wellness services, like on-site fitness facilities

The number of possibilities about health or wellness services is huge. The item was changed in order to make clear that these services or initiatives happens on the workplace and include some more possibilities besides fitness facilities. Its new wording is:

My workplace offers health or wellness services, like health prevention initiatives, on-site fitness facilities or funny initiatives

The following item I17 wording was also challenged:

My current position permits me to experience a career in which I can be committed and devoted to an important cause

An expert highlighted the difference between the concepts of position (or job title) and job functions. He argued that although they are often closely related, however, not all job functions are clearly based on the title alone and that what is usually meaningful in order to have these opportunities are the specific tasks or activities undertaken by an employee. The suggestion was accepted and item changed to:

My job function permits me to experience a career in which I can be committed and devoted to an important cause

The debate with several experts around the item I20 and the meaning of the term "offered benefits", bring again the question about if this item should be formulated like it was proposed and if work-life is the best dimension for it. The item I20 description proposed at the pretest was (without the reverse coding):

I give so much importance to benefits offered like parking, employee discounts or car/home insurance

According with what was previously described as being the concept of benefit used at this study, it is characterized by being a supplement of the cash compensation, and so, easily converted into money. So, in line with this definition, any kind of insurance (and discounts) should be considered as benefit. On the other hand, for example, parking may be considered part of the work-life dimension because it helps to improve the balance between the "work" and the "lifestyle" or, helps the relationship between working and non-working life (Robert Anderson et al., 2009). Given these considerations, the item I20 should cut the "offered benefits" expression and should only give examples of incentives that are clearly under the work-life concept, favoring aspects related with available facilities at the workplace like the parking. So, item I20 will be:

In my work I have facilities such as parking, canteen or interactive spaces that help my welfare

Item I23 was also commented by one expert. This comment was a consequence of the translation option from English to Portuguese previously made. The initial wording was the following:

My current position permits me to experience remaining in my area of expertise throughout my career

The suggestion was accepted. Moreover, the English version of the item was slightly changed by considering that the main issue around it was to measure the workplace stability. The change made put the wording more in line with the initial source (Hsu, Jiang, Klein, & Tang, 2003):

My current position permits me to remain in my area of expertise throughout my career

One expert argued that item I24 should consider not only the technological resources, but any kind of resources. Yet, the idea behind this item is to explore the fact that having the necessary data and good technological resources may represent a possible incentive to employees which specifically work in technological environments. It seems that this fact represents an incentive to work in technologically advanced companies, like the Google Inc. (Belfo & Sousa, 2011b). Even so, although the idea behind the item I24 has remained the same, a slightly change was made on the translation.

Relatively to item I25, its original wording was:

My work allows me with opportunities for increasing my knowledge and skills

And, this item became:

My company allows me with opportunities for increasing my knowledge and skills

The item I27 was also challenged by one expert. Its pretest version was the following:

"My current position permits me to develop a career that permits to continue to pursue my own lifestyle"

This expert suggested that, instead of saying "my own lifestyle", it would be better to say "my individual objectives". Indeed, it can be argued that individual objectives may comprise the maintenance or the achievement of a certain lifestyle. Yet, there are individual objectives that may be beyond a way of living. For example, it is common that certain individuals define ambitious objectives that may only be achievable if they decide to have a harder lifestyle in the present, probably working more than 60 hours a week in order to have a better professional, financial and personal situation in future. The importance of individual objectives is in accordance with the expectancy theory (Isaac et al., 2001), which states that individual goals influence the motivational state of each one, because each person values, in a personal way, the possible rewards that are possible to get through an incentive plan. The suggestion was accepted and item I27 became:

"My current position permits me to develop a career that permits to continue to pursue my individual objectives"

Some experts also questioned the item I28. The wording of this item in the pretest phase was:

"My current position permits me to success by being constantly challenged by a tough problem or a competitive situation"

As other previous items, the item I28 refers to two attitude objects, violating one best practice about writing Likert statements that states that only one should be mentioned (Johns, 2010). The first issue is about the possible success allowed by the employee position. Yet, there is a second issue questioning if the employee is usually challenged by tough problems or competitive situations. In fact, the most important objective of this issue is to question the employee about challenging situations. Consequently, the item I28 is simplified to:

"My current position permits me to being constantly challenged by tough problems or competitive situations"

Revising SMART goal conditions there is a final and important characteristic that should also be assessed. It is essential to check if the goals are realistic. This need is aligned with the "expectancy" dimension of Victor Vroom's valence-instrumentality-expectancy theory (1964). This new item should capture the individual estimation of how well the expected results of a given behaviour are going to

match up with or eventually lead to the desired results, or, the individual's probability that a certain personal effort will lead to the intended performance. It should also be aligned with the goal-setting theory of motivation of Locke and Latham which underlines that goals should be realistic and challenging at the same time, giving individuals a sensation of pride and achievement when they attain them. Indeed, studies support the highest level of effort occur when the task is moderately difficult, and the lowest levels occur with either with very easy tasks or very hard tasks (Locke & Latham, 2002).

The new item (I31) can have the following wording:

"My goals are challenging, but also realistic to achieve, within the defined period"

The other two concepts behind Vroom's theory, "instrumentality" and "valence", are related with the different types of needs, goals, values and sources of motivation of each individual. The "instrumentality" is the belief that an employee will receive a reward if the performance expectation is met. As it was previously presented, a reward may be one among a large number of forms, like extra payment, benefits, commission, recognition or sense of accomplishment. A better instrumentality achieves a higher differentiation of rewards among all the performances. The attractiveness of the rewards depends on the "valence". The valence corresponds to the value that an individual assigns to rewards of an outcome. This instrument has a significant number of items which capture a significant number of diverse forms of incentives, which, when answered by respondents, should be balanced with their potential motivations and the consequent different individual valences of rewards.

Now, the experts' feedback about the alignment is analyzed. Although the instrument of Luftman was basically accepted, there were some few changes on its adoption. This instrument assessed the maturities by using a description at each level. Some comments and proposed changes were precisely made about the maturity levels descriptors used by this instrument.

Item	1 No/poor process (no alignment)	2 Beginning process	3 Establishing process	4 Improved process	5 Optimal process (complete alignment)
A01 Understanding of business by IT team	☐ IT managers lack business understanding	☐ limited business understanding by IT managers	☐ good business understanding by IT managers	☐ business understanding encouraged among IT staff	☐ business understanding required of all IT staff
A02 Understanding of IT by business team	☐ business managers lack IT understanding	☐ limited IT understanding by business managers	☐ good IT understanding by business managers	☐ IT understanding encouraged among staff	☐ IT understanding required of all staff

Table 18. Items A01 and A02 variables and correspondent levels descriptors

The semantic associated to the descriptions used by items A01 and A02 was not clear to one expert. In addition to the translations were not appropriate, it should be better if it is explicitly said what is supposed to be understood and who is supposed to understand. Consequently, Table 18 presents the new items A01 and A02 identifiers and correspondent levels descriptors (underlined words correspond to the changes made).

Relatively to organizational learning, one expert mentioned that item A03 could refer to the importance of an inter-departmental analysis. Indeed, the more the all learning process is planned and each organizational learning initiative is monitored and conducted from the top, at an organizational level, the more aligned is the organization (Vera & Crossan, 2004). Moreover, this is coherent with COBIT scheme of having mixed IT strategy committee to establish an IT strategy at the board level, and an IT steering committee to determine the prioritization and to manage IT-enabled projects, both composed of executive, business and IT management (ITGI, 2007). Table 19 presents a reworded level descriptor of the highest level of item A03.

Another expert said that although the item A04 assessed the informal and flexible communication style as being better as a formal style, his personal experience was that formal style can work pretty alright. Nevertheless, it is important to underline that the professional experience of this expert came basically from the army, a special type of organization, which is not ruled by common practices of most organizations. Also, although another expert has agreed on the importance of having informal communication, he highlighted that formal communication is still important and should not be forgotten. It was explained to him that the higher maturity of style and easiness of access should have a two-way communication, should be informal and flexible. Yet, as a better level of maturity accumulates the characteristics of its lower levels, this means that the higher maturity should also be formal (when needed), besides informal. So, it was decided to make an adjustment on the original wording of the item A04, in order to better explain the rationale of its maturity levels. Table 19 presents these adjustments.

Item	1 No/poor process (no alignment)	2 Beginning process	3 Establishing process	4 Improved process	5 Optimal process (complete alignment)
A03 Organizational learning	☐ Casual conversation and meetings	☐ Newsletters, reports, group e-mail	☐ Training, departmental meetings	☐ Formal methods sponsored by senior	☐ With organizational strategy monitored at interdepartmental committees
A04 Style and ease of access	☐ Only communication from Business to IT; formal	☐ One-way communication, somewhat informal	☐ Two-way communication, formal	☐ Two-way, somewhat informal in addition to formal	☐ Two-way, also informal and flexible as a complement to formal

Table 19. Item A04 and its correspondent levels descriptors

There were two experts that proposed a different translation to Portuguese of item A05. The proposals were accepted and the translation was made.

The items A07 and A08 were also challenged. An expert was confused about the description used to characterize the first maturity level of this item. He questioned that if the item A08 was about business metrics, why should its descriptors refer to IT investments measurement. It was explained that items A07, A08 and A09 were all designed to only measure the value of the IT investments. On one hand, the item A07 will try to measure the value of these investments made by the IT team side

and on the other hand, the item A08 will try to measure the same investments but under the business team side perspective. The item A09 will try to capture the maturity of the link between the metrics of IT and business. Nevertheless, the expert's comment was used to adjust both item A07 and A08, so it will be clearer that these items concern only the IT investments metrics. Those identifiers become "IT metrics used by IT management" and "IT metrics used by business management", respectively item A07 and item A08.

The item A10 was challenged by an expert that suggested some relevant improvements which could give it a better understanding. Table 20 presents the item A10 already changed accordingly.

Item	1 No/poor process (no alignment)	2 Beginning process	3 Establishing process	4 Improved process	5 Optimal process (complete alignment)
A10 Service level agreements	☐ Used sporadically	☐ With some metrics for technology performance measurement	☐ With metrics; becoming enterprise wide	☐ The agreements are widespread across entire enterprise	☐ Agreements also include partners

Table 20. Item A10 variable and its correspondent levels descriptors

As the item A12 mainly refers to the frequency on assessing IT investments, an expert proposed the change of its descriptor in order to emphasize that. Yet, as this item considers not only the frequency, but also the measurement of results and subsequent action, the descriptor remained the same. Even so, some improvements were made on the levels descriptors, especially one, proposed by another expert, which suggested to explicitly consider a post-project evaluation (PPE) to measure the effectiveness of an IT project (Kuruppuarachchi et al., 2002).

An improvement was proposed to the descriptor relative to the fourth level of item A15. It was suggested to include something about the fact of having a mixed IT strategy committee to establish an IT strategy at the board level. This committee, in line with the proposal of COBIT framework, should include executive, business and IT management (ITGI, 2007). The descriptor was changed accordingly as it is presented at Table 21.

The fourth and fifth levels of maturity's alignment of item A16 proposed at pre-test, relatively to organizational structure, were precisely equal. As both these descriptors were just "federal", there was the suggestion to differentiate them accordingly. A qualitative variance was introduced in order to distinguish them. Table 21 presents these and some other adjustments made to better clarify each alignment level, like the clarification of the degree of the possible benefits achieved with a federal structured. Also, the importance of having the subsidiary principle in better organizations is highlighted, where the higher ranking body is looking for supporting and coordinating the smaller bodies (Melé, 2005).

Item	1 No/poor process (no alignment)	2 Beginning process	3 Establishing process	4 Improved process	5 Optimal process (complete alignment)
A15 Formal IT strategy planning	☐ The planning is not done, or done as needed	☐ At unit functional level, light business input	☐ Some business input and cross-functional planning	☐ At organizational level, in strategic committee with CEO, business and IT	☐ With partners
A16 Organizational structure of IT	☐ Completely centralized or decentralized structure	☐ The structure is mostly centralized /decentralized; scarce decision sharing	☐ Balancing a centralized and decentralized structure; Federal principle	☐ The structure is federal; synergies and autonomy are considerably met	☐ Exceptional coordination, synergy and autonomy; Subsidiary principle

Table 21. Item's A15 and A16 variables and their correspondent levels descriptors

The item A17 was also adapted. The proposal of Luftman did not clearly differenciated the maturities of levels 1 and 2. An explicit alternative was proposed considering the possibility of the company does not have any CIO, IT director or equivalent IT manager. Other amendments were made regarding this item in order to explicitly present job descriptors instead just an acronym, like finantial director instead just CFO. The item A18 was also challenged. The descriptors of each level were not absolutely clear to one expert. Some amendments were made in order to make them more comprehensible, especially on the descriptor related to "profit center" concept. The new version of item A17 and A18 are presented at Table 22.

Item	1 No/poor process (no alignment)	2 Beginning process	3 Establishing process	4 Improved process	5 Optimal process (complete alignment)
A17 Reporting relationships of the IT responsible	☐ The IT area does not have a CIO or equivalent in charge	☐ CIO (Chief Information Officer) reports to CFO (Chief Financial Officer)	☐ CIO reposts to COO (Chief Operating Officer)	☐ CIO reports to the one in charge of the business unit	☐ CIO reports to CEO, Chairman or President
A18 How IT is budgeted	☐ IT is a cost center, spending is unpredictable	☐ IT is a cost center by business unit	☐ Some projects are treated as investments	☐ IT projects are always treated as investment	☐ Profit center; Includes partners value, processes efficiency or innovation

Table 22. Item's A17 and A18 variables and its correspondent levels descriptors

One expert specifically suggested using the expression of IT committee at item A20. Also, he said that these committees should ideally have the presence of the chief financial officer (CFO) and of the CEO. Correspondent adjustments were made accordingly.

Some little adjustments were also done at the descriptors of item A21.

The idea behind the facet relatively to item A24 was not really understood by two experts. Indeed, the issues around the sharing of the risks and rewards on information systems projects

between both the IT and the business teams may be complex. The wording was adjusted, reinforcing the specific idea of risks or rewards relatively to IT projects and clarifying that the measure is about the balance of assuming those risks and benefiting of correspondent rewards between the IT and business teams. Table 23 presents the new version of the item A24 variable and its correspondent levels descriptors.

Item	1 No/poor process (no alignment)	2 Beginning process	3 Establishing process	4 Improved process	5 Optimal process (complete alignment)
A24 Culture of shared risks and rewards on IT projects	☐ The IT team takes all the risks and receives no rewards	☐ The IT team takes most risks with little reward	☐ The IT and business teams start sharing risks, rewards	☐ Risks, rewards always shared	☐ Huge culture of risk-sharing; Managers encouraged to take risks

Table 23. Item A24 variable and its correspondent levels descriptors

The item A27 was also changed, where the words "sponsor" or "champion" used at the original Luftman´s instrument needed an adaption to Portuguese language reality. The level descriptors were also reworded in order to clarify the idea that the best scenario is to have a business sponsor or champion of the IT scope. This item is changed as it is presented at Table 24.

Item	1 No/poor process (no alignment)	2 Beginning process	3 Establishing process	4 Improved process	5 Optimal process (complete alignment)
A27 Business sponsors/ champions of the IT scope	☐ Usually there is none sponsors/ champions of the IT	☐ Often have a senior IT sponsor or champion	☐ Common IT and business sponsor or champion at unit level	☐ Common business sponsor or champion at corporate level	☐ CEO is the sponsor or champion for both the business and the IT

Table 24. Item A27 variable and its correspondent levels descriptors

The item A28 is focused on one aspect of the technological and strategic sophistication of the IT. The idea of Luftman was to establish a criteria to assess the extent to which IT is able to "go behind the back office and the front office of the organization" (Luftman, 2003). The five maturity levels go from traditional systems to systems that cover the external scope, driving and enabling the business strategy. It may be difficult and not consensual the definition of each one of these maturity levels. For example, it seems that transactional systems and the decision support systems (DSS) are hardly part of the same world. The firsts are supported by relational and normalized data models, with entity relationship (E-R) diagramming technique, while the DSS are based upon the data warehouse, with multidimensional architecture, with OLAP (On-line Analytical Processing) tools, instead of OLTP (On-line Transaction Processing) tools (Cippico, 1997). Consequently, the item A28 was altered by removing the references to the DSS example. Also, another suggestion about the translation made at this item to the word "driver" to Portuguese was accepted.

One interviewed proposed to present some examples of standards at A29 item. The suggestion was accepted.

Some experts suggested better alternatives to the descriptors to be used in Portuguese language or at a professional environment of Portuguese firms. One example is the A20 item, where "steering committee" needed a better Portuguese expression. The correspondent maturity levels descriptors were also adjusted and reformulated. Another example was the item A36, which referred as career crossover opportunities, had initially a certain translation. One expert suggested some other better possibilities in Portuguese. After consulting some references in Portuguese native language, a specific expression was chosen to explain the career crossover concept in Portuguese (Dutra, 2008). The item measures were adapted accordingly.

(c.v) Summary of the pretest phase

In short, the items regarding the incentive dimension were highly challenged. Among the 28 items used to evaluate this dimension, the great majority (22 items) was either changed or substituted, respectively 57% (19 items) and 4% (3 items) of the total number of items. Figure 37 presents the proportions of the modification degree of the items regarding the incentive dimension.

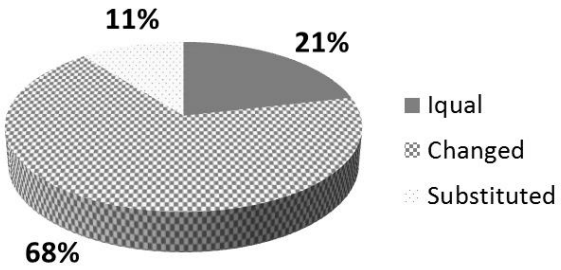


Figure 37: Proportions of the modification degree of the incentive dimension items

Regarding the alignment dimension, there was also a great number of challenged items. From a total of 39 items, there were 19 that were changed after the pre-test phase, corresponding to 49% of all these items. There was no substituted item in this set of items. One possible reason that could justify the lower proportion of challenged items among the alignment dimension, comparatively to the incentive items, could be the fact that the alignment items came from a consolidated instrument (Belfo & Sousa, 2012; Luftman, 2004; Sledgianowski et al., 2008), while the incentive items are, partially new, or came from several other instruments, later adopted by this instrument, with some items also adapted (Belfo & Sousa, 2011a). The Figure 38 presents the proportions of the modification degree of the items coming from the alignment dimension.

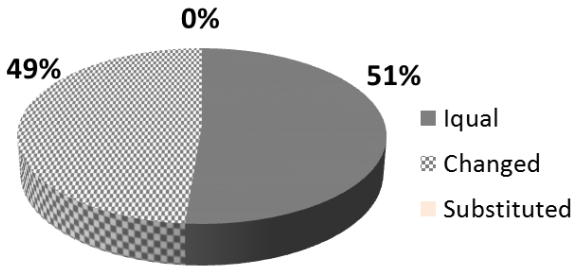


Figure 38: Proportions of the modification degree of the alignment dimension items

In conclusion, independently of the type of item, the majority of them were highly challenged. A majority of 57% (38 items) was changed and there was 4% that was substituted (3), remaining only 39% of unchanged items (see Figure 39). Yet, this doesn't mean that the changes were always drastic. Indeed, a significant number of changes corresponded to minor changes.

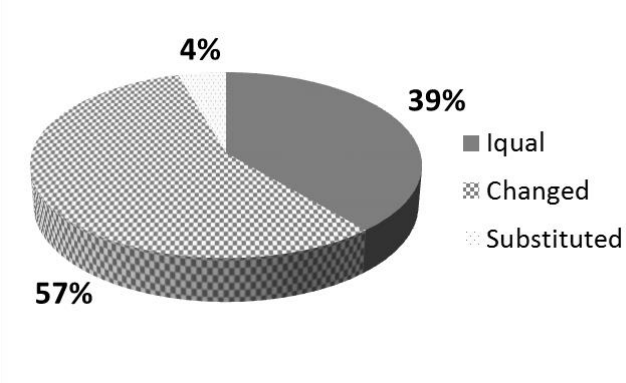


Figure 39: Global proportions of the modification degree of the items

The validation tests and consequent improvement performed with the help of the several experts that participated in the pre-test phase, contributed and were decisive to increment the content validity, construct validity and reliability of the instrument.

Besides modifications on some items, only one participant proposed one significant difference relatively to the five dimensions that have been proposed. Although basically agreeing with the content of every item (all the items were classified as “important” or “essentials” on the next segment by this interviewee), there was an alternative arrangement of the dimensions of incentive construct proposed by him. He mentioned that, although the proposed items already may cover the totality of the incentive construct, another dimension could be defined using some of those existing items. In addition to the five proposed dimensions (compensation, benefits, performance and recognition, work-life, development and career opportunities), this interviewee proposed a sixth dimension of incentive. This new dimension could be called achievement, realization or fulfillment. This expert proposed that some of the existent items could be removed from the current five dimensions of the incentive concept and regrouped in order to create a new dimension. This new dimension could be measure through four of the already proposed items; I09, I12, I16 and I17 from the Appendix 2. According to Maslow, there are sets of basic needs; where one of those is the esteem (Maslow, 1943). The esteem may be classified

into two subsidiary sets: the first, the desire for achievement (self-esteem) and secondly, the desire for reputation or prestige (esteem from other people). Consequently, the incentive construct might consider, in one dimension, the performance and recognition, as it was proposed, and, in addition, consider a complementary dimension named achievement. This proposal was accepted as an alternative approach, which, based on some recommendations (Iacobucci, 2010), could support a competing model.

(d) Pilot test phase

The fourth phase of the instrument development was a brief preliminary survey, using a small and convenient sample (does not need to be a random sample), which is normally defined as a pilot study (Boudreau et al., 2001). According to validation best practices, this research also pilot tested the instrument. Although there are several reasons to conduct a pilot test, the main reasons which led to its fulfillment in this research relate to the development and testing of the adequacy of the research instrument, assessing the viability of a (large scale) survey and identifying possible logistical problems that may occur when using the proposed methods (van Teijlingen & Hundley, 2001). This procedure of carrying out a preliminary study also had the objective of going through the whole inquiry process with a small sample. Consequently, after selecting the web survey tool, this pilot test was composed by the execution of several tests on different settings or personal preferences on different types of computers and, finally, a small and convenient sample was used to collect preliminary data to uncover potential problems.

(d.i) Web survey tool selection

The tool selection is an important phase at a web survey implementation. There are some criteria usually used to select a tool, like language flexibility, workflow possibilities, real time options, available services, reporting capabilities, metadata features, design features, data extraction facilities, flexibility, ease of use, price and limitations (Belfo & Sousa, 2011c). After an analysis among several possibilities (see Table 25), the selected tool was the LimeSurvey.

Characteristics	Google Docs	Survey Monkey	Lime Survey
Definition of tokens		X	X
Customized invitations		X	X
Single answer per participant		X	X
Identification of participants at answers		X	X
Identification of incomplete answers		X	X
Accessibility to incomplete answers content		X	X
Opt-out possibility		X	X
Open source / free software	X		X

Table 25. Comparison among some online survey tools
Source: Adapted from Pedrosa (2015)

Comparing to other tools, like Google Docs or Survey Monkey, the LimeSurvey presents a considerable number of advantages. It allows managing individual tokens, formatting of adequate customized messages to respondents. It also allows sending messages to remember respondents to

answer, with adequate managing functionalities, in order to avoid sending redundant messages (Pedrosa, 2015). Moreover, the Limesurvey software is very versatile because, for instance, it provides diverse capabilities like some specific workflow possibilities considered suitable to the proposed questionnaire as allowing the respondent go back or not allowing jumps forward and some design features like showing a progress bar or not showing the code/number of each question. It also provides several important facilities that were used to help the implementation of some recommended procedures. It allows to test a survey, by previewing the survey before its definitive launch, it lets testing several email models, like an invitation email (Appendix 10), a reminder email (Appendix 12) and a confirmation email (see Appendix 13), and it allows to record the time taken to complete each question or all the questionnaire. The Appendix 8 shows some examples of how Limesurvey's offers some of its facilities.

As at this survey, there was the need to have strict control over who can access it, groups of people authorized to complete the survey were previously defined, usually known as "panels". In LimeSurvey, the panels are implemented by a concept known as "tokens" (CCS, 2015), a code that is unique for each respondent.

(d.ii) Tests on different computers, browsers and settings

As the idea was to ensure that the survey appear and is performed as it should wherever it is answered, several tests were made to guarantee that the online survey worked well on various types of computers, different internet browsers and display settings (Andrews, Nonnecke, & Preece, 2007).

The tests were done at the most common types of computers, as the desktop models, the notebooks (laptops), tablets and smartphones. To implement these tests, firstly, it was created a special respondent for this test, whose "token", was, in second place, used to access the survey through the different computer types. Four different sets of tests were made to evaluate the usability of the graphical user interface (GUI), one for each type of computer, respectively, one desktop, one laptop, one tablet and one smartphone. Although there are plenty of different computers for each type of computer in the market, the tests were done using just one product of each one of these computer types. The desktop tests were made using an Asus Desktop Intel Core i3 4GB with a LG L1919S monitor, the used laptop was a Toshiba Portégé® R830-10R, the tablet was an Apple iPad mini 16GB MD528 and the smartphone used was a iPhone 4S 8GB. Tests were made using a checklist considering some of most relevant aspects of GUI usability that may be evaluated when using each one of these four types of computers (Xu, 2012). The results of these tests are summarized in Table 26.

The tests results were clearly good for the desktop, the laptop and the tablet. The only thing that was not serious, but deserved a correction, was the low resolution of the image with the logotypes of the institutions involved within this research. This correction was done. Relatively to the smartphone, the results were not satisfactory at its original size. Indeed, a smartphone is not the best computer type to answer a survey like this, with dozens of items to answer and with several options to choose. Nevertheless, with an adequate resizing, all GUI components become visible and distinguishable, making possible to properly answer the survey.

GUI Usability Item	A desktop	B laptop	C tablet	D smartphone
Back				
Is the Back UI component/function visible?	Yes	Yes	Yes	*
Does the Back UI component allow the user to back continuously step by step?	Yes	Yes	Yes	*
Progress				
Is the progress UI indicator component visible?	Yes	Yes	Yes	*
Is the progress UI indicator recognizable for the user to understand the current processing stage?	Yes	Yes	Yes	*
Navigation Menu				
Is the navigation menu UI component consistent throughout the user interface?	Yes	Yes	Yes	*
Is the navigation menu UI component visible and distinguishable from the rest of the interface?	Yes	Yes	Yes	*
Buttons				
Are UI Buttons visible and distinguishable from non-interactive components in the user interface?	Yes	Yes	Yes	*
Are UI Buttons simple enough and recognizable to understand its purpose?	Yes	Yes	Yes	*
Multiple Choices				
Are multiple choices visually clear and concise?	Yes	Yes	Yes	*
Is the activated & current choice distinguishable from the rest of the options?	Yes	Yes	Yes	*

* Original size is too small. If size is increased, all components work as they are supposed to work.

Table 26. Websurvey GUI usability evaluation using one product for each type of computer

Most important internet browsers were also used to test the survey. According to the periodically statistics provided by StatCounter, the top 4 browsers at November 2015, were the Google Chrome (47,87%), Safari (12,02%), Internet Explorer (9,75%) and Firefox (9,67%). This statistics was based on aggregate data collected on a sample exceeding 15 billion page views per month collected from across the StatCounter network of more than 3 million websites (StatCounter, 2015). The tests concerning the Google Chrome, the Internet Explorer and the Firefox browsers were made using a Toshiba laptop, the Portégé® R830-10R model. An Apple iPad mini 16GB MD528 was used to test the Safari browser. The tests also adopted the same checklist previously presented considering relevant aspects of GUI usability (Xu, 2012). For each one of them, the questionnaire was downloaded, was seen and answered, step by step, as if it happened in a real situation. All the four tests were completely satisfactory.

Moreover, the online survey was also tested on four different display settings. The Toshiba Portégé® R830-10R laptop, with a 13.3'' LCD Screen LED monitor (with 7.1" height by 11.3" width), was used to test a display resolution of 1366x768 pixels, usually known as the WXGA (an aspect ratio of very nearly 16:9), which is the natural resolution of this monitor, a wide version of the well-established XGA standard (1024x768 pixels, with the old standard 4:3 aspect ratio).The same monitor also tested the display resolution of 1024x768 pixels. The first worked perfectly. The second was not perfect, but it was acceptable. The Asus desktop, previously mentioned, with a LG L1919S monitor, a

19" LCD monitor (with 12.13" height by 14.33" width), and an aspect ratio of very nearly 5:4, was used to test a third standard monitor resolution of 1280x1024 pixels (a standard 5:4 ratio), also known as SXGA, an abbreviation for Super Extended Graphics Array, and was also used to test one last resolution of 1280x960 pixels (the common 4:3 ratio). The third test worked impeccably. Regarding the last display test, as it happened in the second test, and because the monitor resolution did not corresponded to the natural ratio of its monitor, the result was not impeccable, but, yet, was satisfactory.

(d.iii) Online survey tests by respondents

Finally, a small and convenient sample was used to collect preliminary data to uncover potential problems. As, at the pretest phase, several experts were already thoroughly asked to give their opinion about the questionnaire, especially about the clearly of the questions, and the main idea at this pilot test phase was to test the survey as if it was for real, it was decided to run an undeclared pilot test to a short number of respondents. So, the survey was administered to respondents by the same way and with all the same procedures as if it was the real and full scale survey. Here, the respondents, contrary to a participatory test survey, were not previously informed that they were participating in a previous phase of the final survey (Presser, Couper, Lessler, Martin, Martin, Rothgeb, & Singer, 2004).

.A convenience sample of six professionals was contacted to answer to the online web survey. These respondents are personally known persons and they were previously called in order to guarantee their answer. These professionals fulfilled three criteria. First, they were employees on a Portuguese firm. Second, their firm has a large or medium dimension. And, thirdly, they were managers at their firm.

The first professional works in a Portuguese firm with medium dimension, part of a large international group, as a purchasing manager and the second works in a large Portuguese company as an export manager. The others four managers also work in large Portuguese companies as control manager, project manager, director and commercial manager, respectively. It was not stated that the interview was to be a pilot interview (undeclared pilot test). A formal and personalized email invitation was firstly send to the first informant with the corresponding and unique token. The token at the invitation allowed the respondent open the online web survey on the browser of his computer, in the same way as it will be administered in the main study. The Appendix 11 presents the online web survey presented to the respondents and used to answer it.

As this test was an undeclared test, and not a participative test (Presser et al., 2004), respondents were not asked about their interpretation, or possible ambiguities and problems at specific questions. Yet, after they answer the questionnaire, they were only asked about their generic impression of it. Although there were no many comments, they were helpful.

According to some of the best practices about pilot studies (van Teijlingen & Hundley, 2001), in order to improve the internal validity of this questionnaire, several procedures were implemented like:

a. the questionnaire was administered in the same way as it would be administered in the main study
b. it was checked if that all questions were answered

c. the time taken to complete each question was recorded and it was decided whether it was reasonable
d. the time taken to finish the complete questionnaire was also recorded and it was decided whether it was reasonable
e. it was asked a generic feedback to recognize possible problematic issues

The questionnaire answered by the respondents at the pilot test used the same online survey tool and used the same platform that was later used at the full scale survey. The tool was the Limesurvey, version 1.91+, build 11804. The platform was the one provided by the ISCAC Business School, one specifically dedicated to the research studies made by the members of its community. The utilized domain was http://survey.iscac.pt/. The Limesurvey tool has the possibility to configure the guarantee that all the respondents answer all the questions. As all the questions were configured like that, this objective was completely fulfilled.

Question	1st respondent	2nd respondent	averages of 3th to 6th respondent
	purchasing manager at a medium company	export manager at a large company	managers at large companies
About you and your firm	3,29	0,57	1,80
About incentives			
Compensation	0,85	0,85	0,51
Benefits	1,02	0,69	0,54
Performance & Recognition	1,27	0,57	0,52
Work-life	1,76	2,60	1,13
Development & Career opportunities	1,04	2,68	0,33
Sub-total incentives	5,94	7,38	3,02
About alignment			
Communications	5,56	2,49	1,66
Competency/Value measurements	4,27	1,99	1,82
Governance	4,10	3,07	2,12
Partnership	3,61	1,58	5,38
Technology scope	2,68	1,70	2,64
Skills	5,56	1,64	1,35
Sub-total alignment	25,78	12,47	14,97
Complete interview time	35,01	20,42	19,80

Table 27. Time taken to complete each question of the questionnaire at the pilot test

The time taken to complete each question and to finish the complete questionnaire was recorded and later analyzed (see Table 27). The first respondent which was asked to answer the survey took 35 minutes to answer the complete questionnaire. This duration was considered a bit long. If possible, it would be nice reduce it slightly to a value between 20 and 30 minutes, or preferably, to less than 20 minutes.

After analyzing the time taken by the first respondent to answer each question it was possible to conclude that he took too long to answer the questionnaire, especially on the first screen, the welcome message. The respondent took 3,29 minutes to read the welcome screen and to answer the questions "about you and your firm". This correspond to 11% of the 35,01 minutes used to answer the complete

questionnaire. It was decided to remove the text saying a precise time expected to answer the survey. Instead of saying that it would take about a dozen minutes, it was said "... a few minutes of your time to answer questions ..." (see Appendix 9). Moreover, it was decided to significatively simplify and reduce the text at the welcome message in order to diminish the time taken to complete the questionnaire.

In order to make possible to recognize possible problematic issues, a generic feedback about the questionnaire was asked. The first informant commented that it was not very clear that the answer should be given as an employee of the company. Indeed, that is an important issue. It is vital that respondents answer taking into account their own level of incentives in the specific firm environment where they are working and not relatively to any other outside context it. The same happens for the level of alignment. Consequently, both the welcome message and the invitation email were improved and balanced taking into account that suggestion.

After making these proposed changes, the second respondent was also asked to answer the survey. The time taken by the second respondent to answer the full survey was significantly lower. It was 20,42 minutes which was considered acceptable as twenty minutes is a common value for a survey (Belfo & Sousa, 2011c)so. This reduction was, in part, due to the less time spent to read the welcome message and to answer the first section "about you and your firm" (0,57 minutes). It is also expectable that the improvements on the welcome message and on the invitation email may have helped to make clearer the objective of the questionnaire and so, reducing the time of filling it.

Moreover, it was said that it would be nice if users were helped about some concepts or acronyms. It was explained that the idea was to help them by providing hyperlinks to a special page with an explanation to the concept. For example, one of the possible responses of item A08 (business metrics) refers to the balanced scorecard concept: "Balanced scorecard, includes partners". If the respondent had some doubts about the balanced scorecard concept, he could click this underlined expression and a new page should appear helping him with this concept. Even so, all the expressions with a planned help link were tested again and a problem was detected at two of them. A possible response of item A07 (IT metrics) and item A08 (business metric) refers to the ROI concept. The correspondent hyperlink was not working properly. This problem was fixed.

Another aspect that was improved at the invitation's email was the inclusion of incentives to the participation on the survey by the respondents in order to improve the respondents' participation (Belfo & Sousa, 2011c).Two different incentives were proposed. On one hand, it defined the commitment of sending the overall results of the study when ready, which probably will appeal to potential respondents. On the other hand, the commitment to make a donation of one kilo or liter of a food product of first necessity to a social solidarity institution for each incoming survey response.

At this pilot phase, it was also detected that the answers codes of the alignment items were A1, A2, A3, A4 e A5 and that it would be easier to handle them later if they all were converted into just numbers (1, 2, 3, 4 and 5). These codes were changed. The codes of incentive's items were already just numbers and were not changed.

The comments received from the participants did not cause the change of any content of the instrument items.

The accuracy or dependability of the measurement used at this research, usually called scale reliability, can be measured using the Cronbach's Alpha (Cronbach, 1951). This coefficient should validate whether the test designer was correct in expecting a certain group of items to yield interpretable statements about individual differences. In other words, this is a measure for internal consistency of the instrument, a coefficient which means how closely related are a set of items as a group.

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum_{i=1}^{k} \sigma_{Y_i}^2}{\sigma_X^2}\right)$$

Equation 5: The Cronbach's Alpha formula

The Cronbach's Alpha formula is given by Equation 5, where α represents the Cronbach's alpha of a certain latent variable, k represents the number of items used to measure that latent variable, i represents each item of that set of k items, Y_i represents the observed measure for each item i, $\sigma_{Y_i}^2$ represents the variance of the observed total test scores for item i and σ_X^2 represents the variance of the observed total test scores.

latent variable	K number of items	α Cronbach Alpha	CR Composite Reliability
compensation	3	0,582258	0,785107
benefits	5	0,750944	0,843324
performance & recognition	6	0,951432	0,959613
work-life	13	0,732010	0,862823
development & career	4	0,945867	0,962516
communications	6	0,904916	0,931625
competency	7	0,922197	0,939309
governance	8	0,901970	0,929220
partnership	6	0,929040	0,943810
technology	5	0,846034	0,860804
skills	7	0,937683	0,950806

Table 28. Internal consistency results for pilot test

The Table 28 presents the computed coefficients of Cronbach's Alpha for the latent variables using the pilot test results.

A commonly accepted rule of thumb for describing the internal consistency defines the minimum coefficient alphas of 0.70 for research tools (DeVon et al., 2007). With the exception of compensation variable, this table shows that the reliability coefficients range from 0.750944 to

0.951432, indicating that some scales were more reliable than others. Yet, the recommended minimum level for coefficient alpha is not unique and depends on the situation it is used.

In a situation of a preliminary stage of development as this, it may be acceptable a lower reliability coefficient (Peterson, 1994). Nunnally sustained that Cronbach's Alpha values from 0.5 to 0.6 could be acceptable for a preliminary research (as cited in Peterson, 1994). Consequently, the Cronbach Alpha coefficient of the "compensation" scale is also accepted at this stage. Forward, an additional and definitive coefficient analysis will be made using the full scale survey data to try to confirm the internal consistency of all the latent variables.

Another popular assessment for the internal consistency is the composite reliability (CR). While Cronbach's alpha assumes that all indicators are equally reliable (all factor loadings are constrained to be equal, and all error variances are also constrained to be equal), with the composite reliability that does not happen. With the CR, the factor loadings are simply the correlation of each indicator with the composite (construct factor), and the factor correlations are obtained by correlating the composites. So, some authors support that this prioritization of the indicators makes the composite reliability more suitable for the PLS-SEM (Hair et al., 2014; Hair, Ringle, & Sarstedt, 2011). Even though this stage corresponds to a preliminary stage of the research, and lower values are acceptable, all the coefficients values are higher than 0.70, the minimum considered at the rule of thumb for this coefficient. Forward, this rule will try to be confirmed with the full scale survey data.

(e) Full scale survey

(e.i) General procedures of the survey

Then, the full scale survey was implemented. It consisted on the final administration of the instrument to the selected sample. The Appendix 5 presents the English version of the instrument which resulted from the changes made at the fourth phase (pilot test) of the instrument development and it was the one used at final test.

As it was said before, the online survey tool used at the full scale survey was the same used at the pilot test phase. This research used the Lime Survey server that was available by the "*Instituto Superior de Contabilidade e Administração de Coimbra*" (ISCAC) – Business School, created to support research projects promoted by the members of this institution.

The database provided by Informa D&B previously presented, was used to prepare and send an invitation email to participate in the web survey. This invitation email was a personalized invitation sent to the email of the Head of the enterprise (or another top level manager of the enterprise), with his/her name and with the corresponding name of the enterprise. Although a significant proportion of the enterprises of the Informa D&B database were provided with the personal email of the informant, there were also an important number of enterprises with just the general email of the enterprise. As it was previously better explained, the database provided by Informa D&B had 1000 medium enterprises and also 1000 large enterprises.

The Lime Survey facilities were used to define an email model with these corresponding fields in order to help to build a personalized email, in one hand, but also to automate this sending procedure,

making it easier and quicker, on the other hand. The database of the Lime Survey tool was built by importing those fields from the database of the InformaD&B. Each email that was sent had a token which guarantee that each answer correspond to that enterprise informant. The Appendix 9 presents an example of the invitation to participate on the survey sent to the head of the enterprise or another top level manager.

Additionally, as it was previously explained, other informants working at companies of the Informa D&B database and at some few other companies were invited to answer the online survey. As it was argued before, if there was no answer to the invitation email sent to the Head of the enterprise, then, other informants from the same company were also asked to answer, and possibly, compensating the non-response of higher responsibles of the company. If more than one response was obtained by each company, then an average of these responses is calculated for each item.

The Appendix 10 presents an example of an invitation to participate on the survey sent to someone from the LinkedIn social network which is a manager working in a certain enterprise that fits the sample selection criteria.

Although the online surveys are appropriate for large and varied samples because they can be easily distributed over large geographical areas and inter-cultural, their response rates are usually low, possibly introducing high non-response errors. Normally, it is advisable to use follow-up schemes to increase response rates (Skarupova, 2014). So, besides sending a first reminder email, some extra reminders were sent to those respondents that have not yet responded.

(e.ii) Qualitative feedback from definitive respondents

After answering the questionnaire, there were some respondents that send back some relevant comments. A group of them didn't answer the survey but, even so, they argued by email that they could not answer it. Some of their justifications are presented below:

> *"Good afternoon Fernando Paulo Belfo. I appreciate your initiative, which I consider relevant and interesting however the code of ethics of my company does not allow me to provide internal company information to third parties. Those that I am authorized to provide are of public domain and are present in (s) our institutional sites, particularly in ..."*
>
> Systems Administrator at a large chemical company

> *"Dear Fernando Belfo, Unfortunately I am unable to give my contribution to the survey you are driving, because the same request the sharing of information regarding the company I am employee that we do not published externally."*
>
> Marketing Manager at a large information technology and services company

"Dear Fernando, I am sorry but I cannot help you in your research. The privacy policies of the company do not allow me to participate in the questionnaire even if in anonymous mode."

Production Manager at a large automotive industry company

"Hi Fernando, I am afraid my Portuguese isn't up to the standard required to help with the survey but I wish you every success."

Corporate iCS[4] Manager at a large consumer goods company

"Dear Fernando Belfo. Although I'd be happy to do so, unfortunately I will not be able to complete your questionnaire, simply because I do not have information available to support some of the answers to these questions. I am available to work with you in future questionnaires, if you so wish and understand."

Operational Manager at a large telecommunications company

"I appreciate the invitation but unfortunately I cannot help you this time. I started to fill out the questionnaire but I came to questions about my remuneration package which I thought I should not answer. As it did not allowed me to move on, I could not finish it, even partially. I wish you the best of luck for your PhD."

Director at a large retail company

Yet, there were others, that not only responded, but that after answering to the online survey, also replied in a very interesting and encouraging way, like those examples below:

"Good morning dear Fernando Belfo. First of all my compliments and congratulate you about the careful preparation of the questionnaire. I have already answered it."

IT Director at a large paper and forest products company

"Indeed, the alignment between business and IT is a structural factor that may limit a lot the growth of companies. (...) Interestingly, it is felt that the teams take steps in search of that alignment of reinforcement, but very much based on informality, who sins for being unstructured. (...)There is much room for improvement there, and that makes all the difference for companies wishing to invest, grow and scale to other markets. Congratulations for your initiative and good work."

Project Manager at a large oil and energy company

"Good morning Dear Paul, I have just take the survey, grateful for your social contribution. I have interest in receiving the overall result of this study. I thank you."

Project Manager at a large electrical/electronic manufacturing company

[4] iCS: Intelligence Compliance Solutions

"Dear Fernando Belfo. It was with great pleasure that I replied to the questionnaire. I hope that your study has as successful as possible. Above all I must mention that it greatly surprised and pleases me the synergy between the study/research and the solidarity. Best regards. Best wishes for a good 2016."

Legal Manager at a medium sized pharmaceuticals industry company

"Dear Fernando Belfo. It's an interesting questionnaire and that raises important issues for a stronger link between IT and business. In my case, we are in a transition from a time of turning our back on the enemy for a collaborative situation with benefits and common interests."

Chief Operating Officer at a medium sized oil & energy company

"I have finished the answer to your questionnaire, one of the most interesting surveys that was given to me in recent times (especially the second part of it). Good luck in your future endeavors."

Chief Information Officer at a medium sized retail company

(e.iii) Complementary initiatives to reduce non-response rate

Besides the pre-test and the pilot test, some of other best practices on web survey implementation were considered. In order to reduce the non-response rate, several extra initiatives were planned, as (Belfo & Sousa, 2011c):

- Invitation to participate
- Incentives to participate
- Pre and follow up reminders
- Reporting

These initiatives were already explained at section 3.2 (see page 58).

(e.iv) Autonomous, partners and group of enterprises

Although some companies are formally different, as they have a different and unique tax identification number, they may belong to the same groups of enterprises.

There may be different situations. A distinction can be made between three types of companies, depending on whether they are autonomous, whether they have holdings which do not entail a controlling position (partner enterprises), or whether they are linked to other enterprises. This is particularly important on the definition of a SME (small and medium-sized enterprise), where it should be clarified which companies are genuine SMEs and which belong to a group of enterprises. Although there are some exceptions, a recommendation of the European Union Commission defines that an enterprise is not considered autonomous if 25% or more of its capital or voting rights, is directly or indirectly controlled, jointly or individually, by another enterprise (European Union, 2003).

The importance of understanding the concept of an autonomous company is not only important to the SME definition. A partner relation (in less degree) or the relationships established under a group of enterprises may influence not only the economic power of a company whose part or total capital is owned by an holding company, but also its global strategy, and, particularly, the strategy and practical development of its information systems. Of course, the alignment of business with the IT will be dependent of this possible relations and alternative strategies. Among the group of companies that were surveyed by this study, there are a significant number of companies that are not autonomous and are considered partner enterprises or belonging to a group of enterprises.

It could be interesting to analyze a group of companies to see the complex relations among the companies that compose it. Below (see Figure 40), it is presented an example of a corporate organization chart of a large Portuguese machinery group of enterprises called Ascendum Group. This group is a Portuguese group, with more than 1000 employees and a significant international presence, with global reach and one of the largest global suppliers of industrial equipment for construction and infrastructure. According to the management report of 2013 (Mieiro, Morais, Mieiro, Mieiro, & Faustino, 2014), the Ascendum Group operates various brands and in different areas of business, namely on construction equipment and infrastructure, agricultural equipment, trucks and cars.

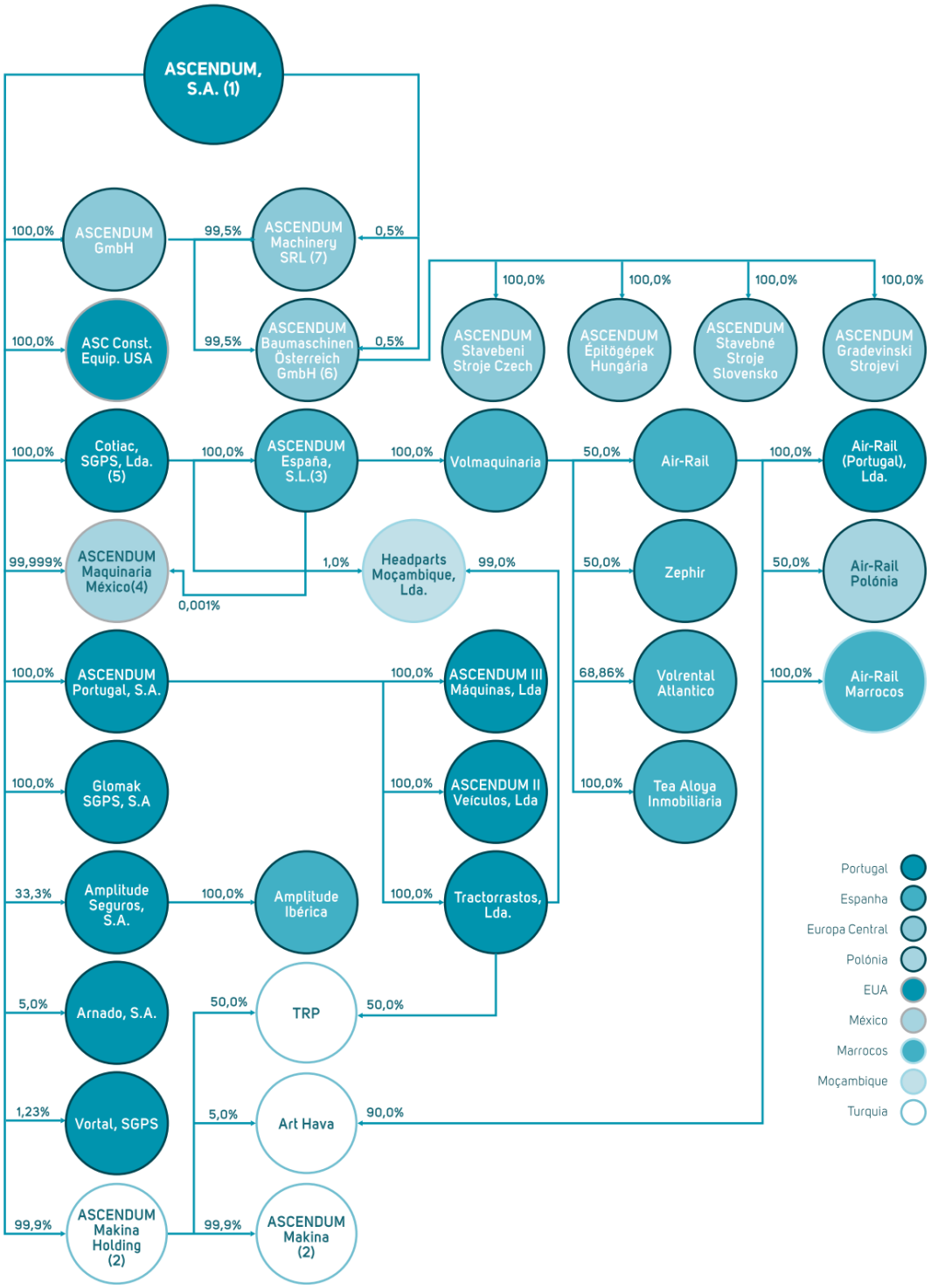


Figure 40: Corporate organization chart of a large machinery group
Source: Retrieved from Mieiro et al. (2014)

As it can be seen at Figure 40, a large group of enterprises like the one presented in the example, may have different types of participation in the capital of each enterprise which composes the group. Some enterprises, with small participations, may run autonomously, others, with larger positions, may act as partner enterprises or linked enterprises, depending on the size of their controlling positions.

Groups of companies are constantly reorganizing its governance model and consequently the relations among their companies. It is relatively common create a new company to act as a sub-holding company of some other companies of the group. Also, some companies may be merged in order to increase synergies on the group. For example, the executive commission of the Ascendum group made a recent merger justified as:

> *"Regarding the activity of Ascendum III Machines in 2013, we highlight the merger of Volrent (company specializing in equipment rental business for construction and public works in Portugal) in Ascendum III Machines, both companies owned 100% by Ascendum Portugal, whose objective was due to increased synergies between the complementary businesses of both companies."*
>
> Management report of 2013 of Ascendum Group (Mieiro et al., 2014)

Of course, the IT departments typically follow these reorganizing movements. The IT governance is normally dependent of the corporate relationship among the companies that constitute the group. If a holding company controls other companies of the group, acting as linked enterprises of it, it is normal that some services as the IT services are centralized, with more or less coordination, synergy or autonomy. Indeed, this aspect of governance is questioned at the survey with the item A16 (Organizational structure of IT). One respondent of another group underlined the following:

> *"Thank you for your invitation to participate in the survey. My answer was as responsible for the Division of Information Systems of the Group. We provide services in the areas of IS/IT, in a logic of shared services, serving all the Group's companies in Portugal, Africa and Spain."*
>
> CIO of a large vehicle assembly, components and distribution business group

The shared services or shared services centers (SSC) are becoming more popular in the last decades, especially at large organizations. A SSC in an organization is an entity which is responsible for the execution and the handling of specific operational tasks, such as accounting, human resources, payroll, IT, legal, compliance, purchasing or security. As shared services are more and more common, and although is not an easy exercise, the responses at this survey were analyzed trying to take that into account. So, if there are different respondents which are working for diverse companies but with apparent shared services at the same group of companies, then the company that was considered on this survey analysis was not the company to which the respondents are directly working, but the holding company of the group.

There are some specificities on having the IT services working with a shared services' logic in an organization. Normally, large organizations, operating in different countries and possibly having a portfolio of businesses in diverse areas, choose a SSC model hoping to get lower costs, better management information/decision support, improved customer service, higher alignment of business services with a global operating structure, consistent standards, and similar costs in different units (PwC, 2008). Yet, the advantages or disadvantages of implementing of a SSC depend on the analysis of the specificities of each organization. Sometimes, it may lead to rigid and burocratic structures, far away from the daily activities and with an inflexible answer to organization needs. Nevertheless, new

digital technologies empower the SSC, enabling processing of most transactions with embedded controls in place; reducing the time cycle, improving access to information, providing accurate, relevant and reliable data through real-time interfaces, analytical reporting, decision support, performance management, among other possibilities (Capgemini Consulting, 2013). Independently of all oportunities or threats on adopting a SSC, there are definitively great differences in this model compared to a classic approach of IT governance, with obvious consequences on the alignment of business with the IT. These specificities were implicitly suggested by another respondent with the following comment:

> *"It was a pleasure to help you in your project, the survey was completed in the circumstances of our organization, where there are operations and shared services with other markets."*
>
> Customer Service Director of a large automotive group

In order to try to clarify potential particularities of the shared services, the previous director was asked to make a short comment about potential strengths and weaknesses of that service on his company in what concerns the IT. His answer was the following:

> *"The shared services consist on only Technical Helpdesk service. With the new technologies, I do not see major loss of quality service. Maybe, if there are some cases with more complicated resolutions, then that may lead in delays in the responding.*
>
> Customer Service Director of a large automotive group

Yet, situations among companies belonging to the same group of enterprises may vary a lot. Not all companies belonging to a group need to share IT services. Another respondent, a business director at a medium size energy industry company, a company which is part of a large economic group with other companies with quite different businesses besides the energy economic activity, addressed the complexity of these relations among its group during a following phone call. He also commented that his group, depending on the company, has different approaches relatively to the IT. Although some companies of his group have their own IT departments with a full package of services, his company outsources its main IT needs. Consequently, this type of situation had a different treatment in what the alignment between business and IT concerns. At this group, different companies were considered because they seem to be relatively independent among each other.

Next subsection presents in more detail, the employed validation strategy adopted along the different phases, evidencing the basic principles used to validate this instrument. As it will be shown, there are validity types which are present at several phases.

3.7 Validation strategy

Information Systems researchers need to validate their research instruments. In 1989, Straub was pointing out that instruments in the MIS (Management Information Systems) literature were insufficiently validated (Belfo & Sousa, 2012). So, he put forward some of the basic principles for validating an instrument. He asserted that an instrument validation should consider some types of validity like content validity, construct validity, reliability, internal validity, statistical and conclusion validity (Straub, 1989). Although the field has progressed significantly, it seems that the majority of published studies continue not having acceptable validated instruments (Boudreau et al., 2001). Therefore, a list of "mandatory", "highly recommended" and "optional, but recommended" validities have been suggested, while presenting and explaining the validity components and related techniques and heuristics (Straub et al., 2004).

phase	name	validation process or test performed	content validity	construct validity	reliability
I	Literature review	Detailed literature review	X	X	
II	Conferences and publications	Blind peer review Conference discussion	X	X	
II	Pretest	Qualitative analysis of the interviews	X	X	
		CVR (content validity ratio)	X		
III	Pilot test	Time spent to answer the survey		X	
		Qualitative analysis of the followup contact	X	X	
		Cronbach alphas			X
		Composite reliability (CR)			X
IV	Full scale survey	Indicator reliability			X
		Cronbach alphas			X
		Composite reliability (CR)			X
		Average variance extracted (AVE)		X	
		Cross loadings		X	
		Coeficiente of determination (R2)			X
		p-value		X	
		Qualitative analysis of model estimation	X	X	

Table 29. Validation processes, tests and types performed by conducted phase

This section wants to answer some of the best practices proposed by the literature (Cragg et al., 2002; Straub, 1989), which suggest that the methodology chapter should explicitly address the instrument validation. A strategy of construct validation involves fundamental components like content validity, internal consistency of operationalization-unidimensionality and reliability, convergent validity, discriminant validity and nomological validity (Venkatraman & Grant, 1986). These were also the main validation concerns throughout this work.

Different types of validation were already explained before and some are still going to be better explained at the next chapter, when the assessment of the model is presented. They can be resumed at Table 29. The main relevant considerations and initiatives about validation of the instrument on each phase may be consulted at the correspondent section.

3.8 Data selection and cleaning procedures

(a) Data selection

The previous descriptive analysis allowed confirming that there was no missing data. This was expected because the software did not allow finishing the questionnaire without answering all the questions. Even so, all responses were inspected in order to check for possible problems. The questionnaire data were examined relatively to the employee function, the company size, the company nationality and unusual data values.

As it was said before, the survey defined the middle or top managers, either from the business or IT, as potential respondents. There were some responses made by employees with an inadequate function to answer the questionnaire and so, they were discarded. Other responses were also discarded because the company size did not fulfill the minimum dimension criteria of large or medium companies. These answers came from respondents working at micro or small companies. There were also a few rejected cases with regard to employees working for non-Portuguese companies. Table 30 presents the number of rejected responses by correspondent reason of rejection and the percentage of rejection relative to the total number of respondents.

Code	Rejection reason	Number of rejections	%
IEF	Inadequate Employee Function	23	42%
ICS	Inadequate Company Size	7	13%
NPC	Not a Portuguese Company	3	5%
OR	Outlier Rejection	22	40%
	Total number of rejections	55	100%
	Total number of respondents	449	
	% of rejection/respondents	12,2%	

Table 30. Number of rejected responses by correspondent reasons and percentage of rejection relative to the total number of respondents

In addition, possible outlier effects were also looked for on answers. There can be univariate or multivariate outliers. Yet, it would be imprudent to discard individuals just because they responded at either the low or high end of a narrow spectrum as the one used at this survey (a Likert scale varying from 1 to 5). So, each univariate distribution was tested for normality (using skewness and kurtosis tests), but not for univariate outliers.

Nevertheless, test for multivariate outliers could make sense. One possible method to detect outliers consists in using a scatterplot, where each point represents an answer, combined with a regression line that allows a visual comparison with all those points, evidencing possible outliers. Figure 41 presents a scatterplot graph with enterprises represented as single points in the incentive and alignment dimensions.

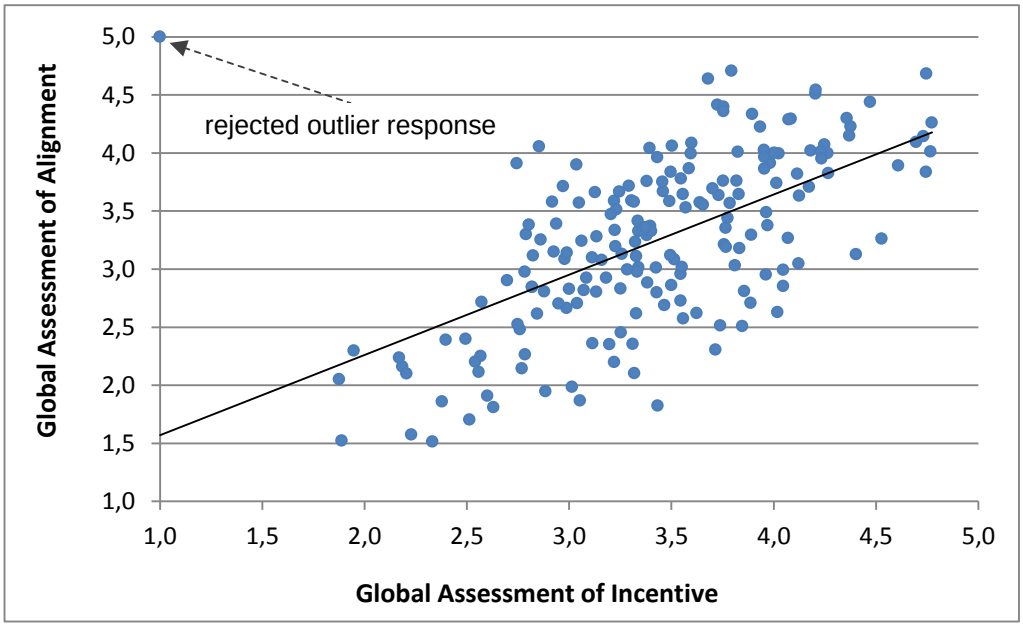


Figure 41: Scatterplot graph with enterprises represented at incentive and alignment axes evidencing a rejected outlier response

Although it may not be easy to detect, some outliers mat comes from an intentional/motivated misreporting or careless responses. The respondents that did not take enough attention to each question and responded them without a careful reflection may excessively repeat the same answer producing a big kurtosis value. A clear situation is shown in Figure 41. There, it is shown a point representing a outlier response that was rejected because it is clearly not correct as it has all answers of incentive domain classified as 1 and all answers of alignment classified as 5. Yet, other outliers are more difficult to detect, and even they are detected, are not so clearly judged as to be rejected.

A possible way that could help the detection or confirmation of deviant responses and behaviours is the usage of the kurtosis and the skewness tests in multivariate approach. Indeed, the same rejected response presented at Figure 41 has a high kurtosis value (infinite if the incentive and the alignment domain are analyzed separately).

Another possible way to check for responses with an abnormally number of question responses, concerns the possible outliers identification associated to data points lying evidently outside the general linear pattern of which the midline is the regression line defined using the dependent variable of alignment and the independent variable of incentives. Usually, observations with high standardized residual values are likely to be outliers. A standardized residual value above or below ± 2.24 requires close scrutiny since it indicates that an observation is unusual in the Y value (Aguinis, Gottfredson, & Joo, 2013). The previous shown case at top left of Figure 41 clearly violates this rule as well (with a standardized residual of -5.41).

Of course, detecting outliers doesn't mean we should throw them out without thinking, neither ignoring them. Their detection is an opportunity to think of reasons why observation may be different. Just after closer analysis, the decision of dropping them or not is made. This is why, in case of doubt, several other responses were kept as valid at this survey data analysis. Indeed, they could result of

outliers representing legitimate cases sampled from the correct population or outliers coming from faulty distributional assumptions (Osborne & Overbay, 2004).

(b) Cleaning procedures

The objective of this section is to decide what to do with possible quality problems of the data. Although it was difficult to check all questions, at least it was possible to verify those relating the enterprise, respectively its activity sector and its size. Those two questions could be roughly checked because each token was associated with a particular enterprise of the D&B database containing that same enterprise information. The activity sector and the size were analyzed and some corrections were made. An example with a cleaning procedure made to a set of answers of a respondent is presented below, showing the possible complexity of existing relations among the companies and its employees of a group of enterprises.

One respondent, an executive board member of a medium sized Information Technology and Services company, answered the questionnaire, classifying its company as an IT company. Yet, after consulting and analyzing its profile at LinkedIn social network, it was possible to clarify that this professional was not only responsible for this company, but he was also the Chief Information Officer in a large company of Infrastructures management of land transport with more than 1000 employees. Indeed, the first medium sized company is part of the group of enterprises that the second company aggregates. Consequently, the class code regarding the size of the company and the code regarding the economic activity was changed accordingly. Also, there is the need to insert a tax identification code for each one of the respondents that will act as a database key, allowing a later aggregation at company level. This will permit the computation of averages and other statistics at company level, and so, its later analysis. At this example, the tax identification code became the code of the large company, the holding company of the group.

Like this previous example, other responses were adjusted. This was a very time consuming process, requiring a careful qualitative analysis of the respondents' professional experience, of the companies at their curriculum, about possible relations among those and others companies. Even so, although there was a substantial effort at the analysis of most these complex networks, as this process is complicated and the available information is not complete, it cannot be stated that all adequate changes were made.

3.9 Used tools

Besides the word processing program Microsoft Word 2010 and the spreadsheet manager Microsoft Excel 2010, the tools that were used at this thesis were:

- a software to manage references and a supplement used at the word processor,
- a web application to manage online surveys responses,
- a statistical software for structural equation modeling and
- a software for econometrics and time series analysis.

The used tool to manage references was the Endnote software, version X7. The Endnote is an industry standard bibliography generator and reference manager that has plenty of features like allowing to collect and organize references, either typing in or capturing references from electronic resources, allowing to create bibliographies, using expanded format options, with more than 6,000 reference styles or using diverse reference types such as interview, podcast, conference paper and press release.

Besides the EndNote software, a supplement called Cite While You Write™ (CWYW), was also installed at Microsoft Word 2010, giving access to EndNote references and formatting commands with an EndNote tab in Word. This supplement easily and quickly helps citing references, figures, and tables, and creating a paper with properly formatted citations, a bibliography, figures, and tables.

The used software to manage the responses of the online survey was the LimeSurvey (formerly PHPSurveyor). As it was previously explained, this software is an open source web application to develop, publish and collect responses to online or offline surveys. The used version of the LimeSurvey was the 1.91+, build 11804. The ISCAC Business School gave access to use this software, properly installed at its infrastructure with the objective of supporting the development of any type of academic surveys.

The selected statistical software package to enable doing structural equation modeling was the SmartPLS (Christian Ringle, Wende, & Will, 2005). The version that was used was the 2.0 M3. This software was developed by Ringle, Wende and Will and launched in 2005, and since than its popularity has grown significantly (Wong, 2013). This software was programmed in Java and has a graphical user interface for variance-based structural equation modeling (SEM) using the partial least squares (PLS) method. It was used to analyse the collected data from the survey and to test the hypothesized relationships. Some specific aspects of this tool are better explained further on.

Another software for econometrics and time series analysis was also used. This tool, called Numerical Analysis for Excel (NumXL), is an add-in for Microsoft Excel developed by Spider Financial. Its specific usage at this thesis is also better explained ahead.

3.10 Ethical considerations and social responsibility

This study surveyed hundreds of companies, medium and large-sized, from different industries in Portugal about the maturity of their incentive and their business and IT alignment. If these assessments become easily visible, it could leave certain companies in a more fragile situation than others (Timothy Ryan, 2010). Although it is unlikely, if that happens, this could potentially damage their public image and their value. For that reason, the companies' names are omitted.

Also, as it was already explained, this study is based on the perceptions of key informants about their companies. Yet, possibly based on a set of implicit criticisms of the informants about their organization, their assessment of the alignment maturity, and, specially, their assessment about the level of incentives offered by their company, might reveal a negative view of the company's status. As these issues are sensitive, if these assessments become public, it may jeopardize the position of these informants at their organization. Consequently, according to best practices, the treatment of data and the presentation of the findings were done in a way that could guarantee the confidentiality of the informants (Kouakou, 2013; Timothy Ryan, 2010). The principle that participation would be voluntary and that personal information and responses would be kept confidential were explicitly communicated to respondents at the invitation letter (see Appendix 9 and Appendix 10).

Although this study has encouraged potential respondents to participate at the survey, they also had the option to opt out right after the invitation letter or at any time thereafter. The web survey application Limesurvey managed to register not only the survey's responses, but also the dropouts. It was also decided to send a personalized message to answer all the respondents that replied to the invitation email with another email, regardless of having answered the survey or not, eventually justifying their lack of response for some specific reason. Although this type of more personalized interaction with some inquired managers has not been a face-to-face interaction, it was very rewarding.

Furthermore, there was an agreement that was signed by the author and by the Informa D&B (Dun & Bradstreet) company that reinforced some of these principles and that stated that both parts were commited to comply with the Portuguese legal provisions relating to the protection of personal data. This agreement also stated that the database of companies provided could only be used within the academic research project concerning this PhD thesis.

In addition to the presented ethical issues, there were also some incentives to the participation, including a social responsibility initiative. The idea was to do an endeavour to somehow have a positive effect on others. This was tempted by underlining that answers were very important to complete the study. Then, after processing and analysing all the responses, there was a promise to send back the overall study results. Furthermore, there was a promise to make a donation of 1 kilo/liter of a basic food item to a Social Solidarity Institution for each survey response received.

4 FINDINGS

This chapter presents most important findings of this research. First, a section that presents the number of invitations made and the correspondent response rate. Secondly, a descriptive statistic of the respondents and the companies is made, considering the dimensions of the incentive and alignment. After, this chapter will show the case of a specific company, selected from the companies surveyed at this study, and that will be used as a brief example to demonstrate an assessment of business-IT alignment maturity. Then, results of the model assessment are presented, respectively, the measurement model assessment of the lower-order, the higher-order components and the hierarchical structural model. The discussion of these findings will be done at the next chapter.

4.1 Response rate

The accumulated number of persons (connections) invited to participate, versus the number of valid answers received, coming from the sample of contacts of Informa D&B and the LinkedIn social network are presented at Figure 42 and the Figure 43, respectively. The values at these graphs are represented on a logarithmic scale. As it can be observed, although the total number of invitations made from the oficial contacts of the Informa D&B sample was bigger that those coming from the LinkedIn Social Network, the number of responses coming from the Informa D&B sample was significantly lower than those coming from the social network.

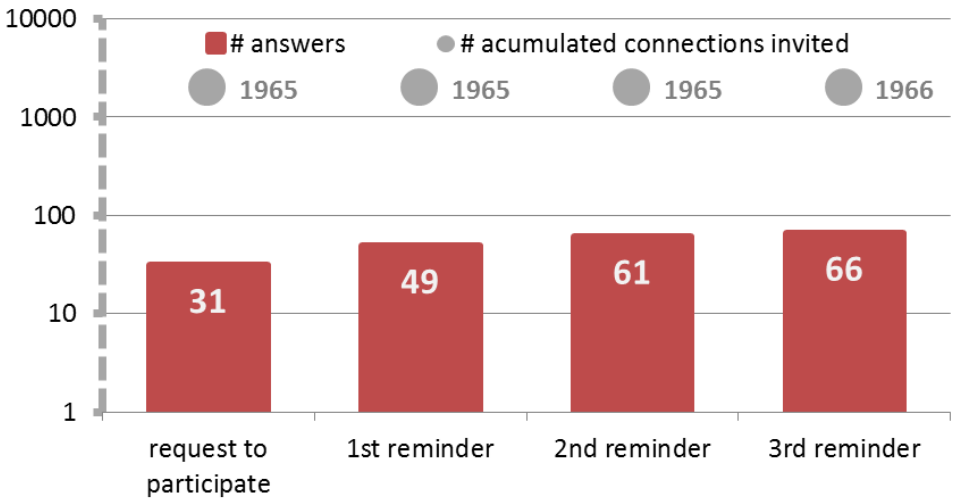


Figure 42: Number of accumulated connections invited versus the number of valid answers received by collection phase from the sample of contacts of Informa D&B

The Table 31 summarizes the total number of accumulated connections invited to participate, the total number of usable questionnaires and the correspondent response rate by source type of contacts.

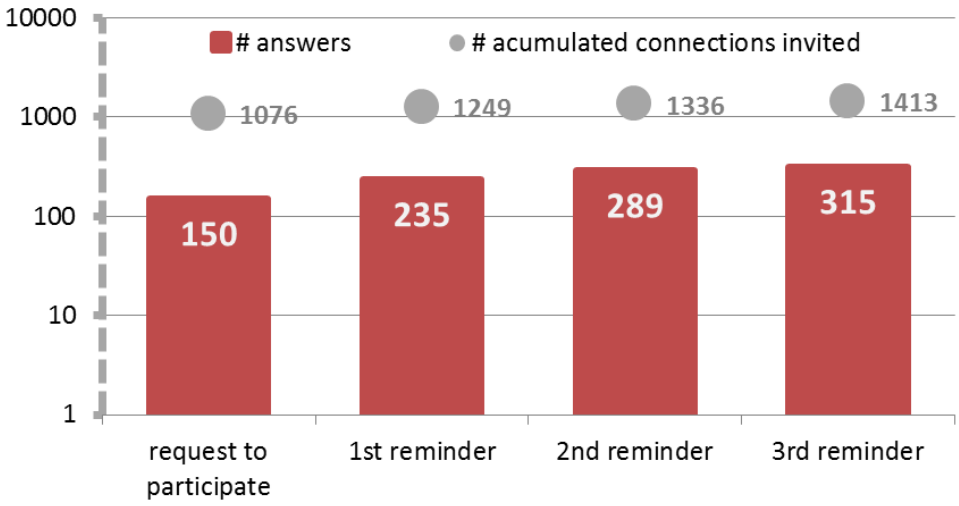


Figure 43: Number of accumulated connections invited versus the number of valid answers received by collection phase from the sample of contacts of LinkedIn Network

The Table 31 illustrates that the response rate of the sample of collected contacts from Informa D&B is significant lower than the one relative to the contacts collected from the LinkedIn social network. The response rate of the first and the second sources are approximately 3% and 23%, respectively. The combination of these two sources has a response rate of 11%.

source type of contacts	number of contacts	number of valid questionnaires	response rate
Informa D&B	1966	66	3%
LinkedIn Social Network	1413	319	23%
combined sources	3379	385	11%

Table 31. Number of accumulated connections invited to participate, number of usable questionnaires and correspondent response rate by source type of contacts

The response rates of this study are not really surprising and are in line with the expectations. Indeed, the non-response rate of online surveys is usually higher than the paper-based surveys.

The Table 32 shows other recent studies about the alignment, that used similar instruments and that also used web survey techniques, eventually complemented by other survey techiques. As it can be seen, these other surveys had response rates that varied from 3,6% to 23,7%. Even so, online surveys using follow-up schemes and other complementary survey techniques seem to have higher response rates (Belfo & Sousa, 2011c; Skarupova, 2014).

Author, Year	Complementary Survey Techniques	Number of contacts	Number of Valid Responses	Response Rate
Cook, 2011	invitation letter via post office mail	4500	161	3,6%
Kouakou, 2013	invitation via post office mail	2000	116	5,8%
Denford, 2009	invitation letter via post office mail and a hardcopy questionnaire	1450	168	11,6%
Ali & Green, 2012	-	1116	176	15,8%
Aloini & Martini, 2013	-	500	112	22,4%
Doherty, 2010	previous/reminder phone call posterior email reminder	535	127	23,7%

Table 32. Response rates of recent alignment researches using web survey tecnhiques

The response rates of this study show that the previously defined strategy, based on using, not only official contacts, correspondent to main companies' representatives, but also by supplementing it with other sources of contacts, was correct. The low response rate coming from the sample of contacts of Informa D&B may be partially justified with the fact that some of the used emails to invite the companies' managers to participate were not their own emails, but the emails of another persons, possibly an assistant. If the contact was direct, probably, this would favour the number of answers obtained. The low response rate coming from the contacts of Informa D&B confirms that is extremely difficult to get answers from companies top managers without other special complementary initiative. The second complementary approach, by using a personal conection to support the invitation to answer the survey, had a significantly higher level of response rate, helping to get a remarkable number of valid questionnaires received.

Although most inquired managers that didn't respond the survey did not say what their reasons were, it is understandable that one major reason for non-response was the lack of availability. As mere examples, here are the justifications of two non-responses based on the lack of availability:

> *"Thanks for contacting our President and the opportunity to participate. We inform you that at this time, there is no availability to respond to the proposed survey."*
>
> Director of Communications and External Relations of a large oil & energy company

> *"Taking into account the high number of requests for curricular studies that our company received in this period, we are sorry that on this date we do not have availability to collaborate in this project. We rely on your understanding and wish you succeed at your academic training."*
>
> Directorate of HR and Communication of a large food & beverages company

Indeed, these testimonies show that it is not easy to get a response of a non-compulsory survey, like this one, from a chief officer.

4.2 Descriptive statistics of respondents

The Table 33 presents the distribution of respondents by their function at the company.

Number of Respondents	Description	%
277	Business	70,3%
52	Business Director	18,8%
27	Chief Executive Officer (CEO)	9,7%
24	Chief Operating Officer (COO)	8,7%
19	Chief Commercial Officer (CCO)	6,9%
17	Chief Financial Officer (CFO)	6,1%
12	Project Manager	4,3%
10	Chief Sales Officer (CSO)	3,6%
8	Chief Technology Officer (CTO)	2,9%
7	Product Manager	2,5%
6	Chief Human Resources Officer (CHRO)	2,2%
6	Chief Procurement Officer (CPO)	2,2%
5	Chief Supply Chain Officer (CSCO)	1,8%
84	Other Business Managers	30,3%
100	IT	28,7%
117	IT	29,7%
65	Chief Information Officer (CIO)	55,6%
40	IT Manager	34,2%
5	System Analyst	4,3%
1	Chief Architect	0,9%
1	Continuous Improvement Manager	0,9%
1	Enterprise architect (EA)	0,9%
1	IT Developer	0,9%
1	IT Project Manager	0,9%
1	BPM Coordinator	0,9%
394	Total	100,0%

Table 33. Distribution of respondents by company function and by business-IT area

As companies have normally more business managers than IT managers, it was easier to get answers from business side and so, the number of business respondents was greater than the IT respondents. Because of this reason, there were some respondents of the IT side whose answers were also accepted at this study, because, even they are not really managers, they usually work close to them and are usually familiar with the objective and the difficulties of aligning the business with IT. For example, a system analyst is normally challenged to work with business partners on business processes, trying to align technology solutions with business strategies.

As it is usually really difficult to get responses from chief executive officers (CEO) of large companies, which are normally too busy to get time to answer all the surveys they are challenged to respond, the number of responses of CEO was petite. Yet, although the number of CEO's responses was small, it can also be observed that the majority of the business's respondents were senior managers, namely chiefs or directors. The Table 34 presents the distribution of respondents by level of

management and by business-IT area, showing that, roughly, approximately half of the respondents are top level managers.

Description	Business	IT	All
Number of respondents			
	277	117	394
Top level managers	135	66	201
Other managers	142	51	193
Percentage of respondents			
	70%	30%	100%
Top level managers	49%	56%	51%
Other managers	51%	44%	49%

Table 34. Distribution of respondents by level of management and by business-IT area

One interesting issue previously raised was to know if there is a significant difference of the maturity assessment of the incentive and the alignment among the respondents of business and IT.

Code	Description	Business	IT	All
	number of respondents:	277	117	394
	Incentive			
CMP	compensation	3,24	3,02	3,17
BNF	benefits	3,03	2,90	2,99
P&R	performance & recognition	3,89	3,77	3,86
WKL	work-life	3,56	3,62	3,58
D&C	development & career opportunities	3,87	3,88	3,87
	Global Assessment of Incentive	3,52	3,44	3,49
	Alignment			
COM	communications	3,34	3,43	3,37
C&V	competency & value measurements	3,25	3,16	3,23
GOV	governance	3,26	3,46	3,32
PRT	partnership	3,33	3,30	3,32
TEC	technology scope	3,42	3,55	3,46
SKL	skills	3,06	3,03	3,05
	Global Assessment of Alignment	3,28	3,32	3,29

Table 35. Average maturities of incentive and alignment dimensions of all respondents according to their area (business or IT)

The Table 35 presents the averages of latent variables of the incentive and alignment according to the functional area of the respondents (business or IT). Although the unit of analysis is the enterprise, this table does not consider the company where the respondent works for, as it intends to evidence possible specificities according to the functional area where the respondent comes from. So, the averages presented here are simple arithmetic averages calculated among all the respondents.

As it can be seen, there is no big difference among the assessments of business and the IT respondents of incentive and alignment higher order constructs. The respondents of the business side seem to be slightly more motivated than IT respondents and IT respondents seem to have a slightly higher evaluation about the company alignment than their colleagues of the business side.

Code	Description	Female	Male	All
	number of respondents:	52	342	394
	Incentive			
CMP	compensation	3,17	3,17	3,17
BNF	benefits	2,99	2,99	2,99
P&R	performance & recognition	3,65	3,89	3,86
WKL	work-life	3,53	3,58	3,58
D&C	development & career opportunities	3,73	3,89	3,87
	Global Assessment of Incentive	3,41	3,51	3,49
	Alignment			
COM	communications	3,27	3,38	3,37
C&V	competency & value measurements	3,27	3,22	3,23
GOV	governance	3,26	3,33	3,32
PRT	partnership	3,28	3,33	3,32
TEC	technology scope	3,49	3,45	3,46
SKL	skills	3,11	3,04	3,05
	Global Assessment of Alignment	3,28	3,29	3,29

Table 36. Average maturities of incentive and alignment dimensions of all respondents by gender

In what concerns the gender, the Table 36 shows that men seem to be a little more incentivized than women at their companies. This is more obvious at performance and recognition or development and career opportunities dimensions. The difference among them is not so clear at alignment.

The average assessment of respondents about the incentive and the alignment according to their age is presented at Table 37. This statistics shows an apparent difference among respondent ages. Younger respondents seem to be less motivated than older respondents, especially at compensation, benefits or performance and recognition dimensions.

Code	Description	<35 years	>=35 years <50 years	>=50 years <69 years	All
	number of respondents:	41	271	82	394
		10%	69%	21%	100%
	Incentive				
CMP	compensation	2,91	3,11	3,52	3,17
BNF	benefits	2,74	2,96	3,20	2,99
P&R	performance & recognition	3,58	3,82	4,12	3,86
WKL	work-life	3,41	3,56	3,71	3,58
D&C	development & career opportunities	3,82	3,82	4,06	3,87
	Global Assessment of Incentive	3,29	3,45	3,72	3,49
	Alignment				
COM	communications	3,28	3,31	3,60	3,37
C&V	competency & value measurements	3,11	3,18	3,43	3,23
GOV	governance	3,30	3,28	3,48	3,32
PRT	partnership	3,31	3,29	3,45	3,32
TEC	technology scope	3,38	3,43	3,57	3,46
SKL	skills	3,07	3,00	3,20	3,05
	Global Assessment of Alignment	3,24	3,25	3,46	3,29

Table 37. Average maturities of incentive and alignment dimensions of respondents by age

The same phenomenon seems to happen at the alignment. Here, older respondents appear to see the company with a higher alignment maturity, particularly at communications or technology scope dimensions.

4.3 Descriptive statistics of companies

With regard to companies, their distribution by economic activity is presented at Table 38. The companies were grouped with a logic of similarity of economic activity, according to the official classification of Portuguese economic activities defined by *Instituto Nacional de Estatística*, I.P. (INE, 2007).

As it can be seen, the major group of companies, with approximately a third of the total number of surveyed companies, is from the manufacturing industries sector. The second largest group consists of companies coming from the trade (wholesale and retail) and vehicle repair sector with almost one fifth of the total number of companies. The other companies are spread across all the other activities sectors.

Code	INE[5]	Description	#	%	Incentive Level	Alignment Level
1	A	Agriculture, livestock, hunting, forestry & fishing	2	0,8%	3,39	2,98
2	B	Extractive industries	1	0,4%	2,63	1,81
3	C	Manufacturing industries	74	31,0%	3,48	3,23
4	D	Electricity, gas, steam and water	10	4,2%	3,48	3,13
5	F	Construction	13	5,4%	2,97	2,86
6	G	Trade (wholesale and retail); vehicle repair	44	18,4%	3,62	3,35
7	H	Transportation and storage	16	6,7%	3,41	3,39
8	I	Accommodation, catering and similar activities	6	2,5%	3,74	3,64
9	J	Information and communication activities	19	7,9%	3,54	3,37
10	K	Financial and insurance activities	18	7,5%	3,81	3,51
11	L	Real estate activities	2	0,8%	2,36	2,56
12	M	Consulting, technical and other similar activities	13	5,4%	3,62	3,28
13	N	Administrative activities and support services	5	2,1%	3,70	3,46
14	Q	Health activities	11	4,6%	3,00	2,81
15	E	Capture, treatment and water supply; sewerage, waste management and remediation	4	1,7%	3,25	3,10
16	P,S	Education and other service activities	1	0,4%	3,44	2,82
		Total	239	100,0%	3,48	3,25

Table 38. Distribution, average of incentive and alignment of surveyed companies by economic activity

The Table 39 presents the descriptive statistics for the 31 incentive's measured variables (28 plus 3). The skewness and kurtosis values of those indicators will be used to discuss its normality assumption. Indicators with averages or standard deviations either too low or too high will be discussed ahead, at the next chapter.

The most usual employed techniques for estimating the SEM models assume the multivariate normality (Ullman, 2006). The multivariate normality, also known as the multivariate normal distribution or multivariate Gaussian distribution, is a generalization to higher dimensions of the univariate normal distribution (one-dimensional normal distribution).

Both statistical and graphical methods may be used to evaluate normality. The skewness and the kurtosis are very widespread measures to inspect for univariate distributions. The most popular graphical method is the histogram (although the normality plot is also popular).

The skewness is the asymmetry measure of the probability distribution of a random variable about its mean. It assesses the amount of skew, the deviation from the horizontal symmetry, being approximately zero if the data are approximately symmetrical, negative when the longer tail is at the left side (meaning that most scores are at the higher end of the scale, and so, at its right side) and positive

[5] The oficial economic classification of Instituto Nacional de Estatística is a hierarchical classification where the highest level is defined with a letter (Section), followed by two-digit (division), then a three-digit (group) and then, a classification four digit (Class).

when the longer tail is at its right side (meaning that most scores are at the lower end of the scale, and so, at its left side) (Hair et al., 2014; Weston & Gore, 2006).

Code	Description	Average	Standard Deviation	Variance	Skewness	Kurtosis
I01	Base Wages	3,3448	0,7914	0,6263	-0,3615	0,2324
I02	Premium Pay	3,2738	1,2198	1,4880	-0,4553	-0,6662
I03	Variable Pay	2,8888	1,1579	1,3407	-0,1408	-0,8490
I04	Car Benefits	3,1358	1,3779	1,8985	-0,3027	-1,2112
I05	Health and Welfare Benefits	3,4372	1,3221	1,7478	-0,7025	-0,7197
I06	Retirement Benefits	1,9187	1,2924	1,6702	1,1988	0,0356
I29	Pay for Time Not Worked	3,2218	1,3632	1,8582	-0,4042	-1,0496
I30	Personal Usage Benefits	2,9418	1,1978	1,4347	-0,0396	-0,8972
I07	Performance Evaluation Criteria	3,7609	1,0251	1,0509	-0,8406	0,4189
I08	Performance Management Participation	3,6744	1,0166	1,0334	-0,5751	-0,0826
I09	Job Enjoyment	4,4155	0,6169	0,3805	-1,0001	1,0643
I10	Job Objectives Explicitness	3,8357	0,9246	0,8549	-0,7366	0,3162
I11	Recognition	3,7590	0,9191	0,8447	-0,7319	0,6090
I31	Expected Results Reachability	3,8110	0,8724	0,7611	-0,7365	0,9020
I12	Work Assignment Flexibility	3,7345	0,7486	0,5603	-0,5019	0,9319
I13	Work Schedule Flexibility	3,6272	0,8824	0,7787	-0,5363	0,3718
I14	Time Off Easiness	3,9916	0,8850	0,7832	-1,0193	1,1600
I15	Health and Wellness	2,8638	1,2131	1,4717	-0,0446	-0,9790
I16	Company Results Pride	3,8523	0,9000	0,8100	-0,8328	0,9510
I17	Community Involvement	3,6670	0,9218	0,8497	-0,6424	0,4141
I18	Caring for Dependents	2,9133	1,0312	1,0634	-0,1265	-0,4553
I19	Financial Support	2,4175	1,1828	1,3990	0,3348	-0,8964
I20	Voluntary Benefits	3,5405	0,9680	0,9371	-0,5105	-0,0006
I21	Team Work and Diversity	3,7537	0,9001	0,8102	-0,7225	0,4911
I22	Culture of Listening	3,9308	0,8752	0,7660	-0,9444	1,2836
I23	Workplace Stability	3,9235	0,8220	0,6758	-0,9829	1,9500
I24	Available Equip. and Data	4,1213	0,7998	0,6396	-1,4311	3,4122
I25	Learning Opportunities	3,8904	0,8613	0,7419	-0,8859	1,0569
I26	Coaching and Mentoring	3,6799	0,9442	0,8916	-0,6689	0,5140
I27	Advancement Opportunities	3,7740	0,8612	0,7417	-0,7768	1,0119
I28	Challenging Problems or Situations	4,1460	0,7729	0,5974	-1,2049	2,5256

Table 39. Descriptive statistics for incentive's manifest variables

The equation used at this study for the calculation of skewness is the popular adjusted Fisher-Pearson standardized moment coefficient defined at Equation 6, where $\bar{x}$ is the sample mean and s is the sample standard deviation of n participants.

$$skewness = \frac{n}{(n-1)(n-2)} \sum_{i=1}^{n} \left(\frac{x_i - \bar{x}}{s} \right)^3$$

Equation 6: The adjusted Fisher-Pearson standardized moment coefficient

The kurtosis is a measure of the peak and tails of the distribution. If the kurtosis is highly positive, it reflects peaked distributions (i.e., leptokurtic), with few outliers. If the kurtosis is highly negative, it means that distribution is quite flat (i.e., platycurtic), indicating many outliers (Hair et al., 2014; Weston & Gore, 2006).

Although there are other kinds of kurtosis, the used kurtosis measure was the sample excess kurtosis and is defined by the following formula:

$$K = \frac{n(n+1)}{(n-1)(n-2)(n-3)} \frac{\sum_{i=1}^{n}(X_i - X_{avg})^4}{s^4} - \frac{3(n-1)^2}{(n-2)(n-3)}$$

Equation 7: Sample excess kurtosis

Some of major software programs with statistical features as Excel, Minitab, SPSS or SAS use this equation to calculate the skewness. The Microsoft Excel (Microsoft, 2010) was the software program used by this study to calculate both skewness and kurtosis measures.

The Table 39 presents the main descriptive statistics for the incentive's manifest variables. Some of these indicators also deserve and will to be commented later, because their averages or standard deviations are presenting significative differences relatively to the global incentive average or standard deviation.

The normality of indicators is analysed, through skewness and kurtosis values. The great majority of these variables accomplishes a traditional rule of thumb for skewness and kurtosis that states that those two measures should have absolute values lower than 1 (Hair et al., 2014). If a more flexible criterion is considered, which states that extreme skewness indexes are only met if absolute values are higher than 3.0, then none of them fulfil that condition. Also, none of them appear to have severe problems with the kurtosis indexes, since all of their absolute values are lower to 10.0 (Weston & Gore, 2006). Consequently, the multivariate normality, implicit at most usual employed techniques for estimating the SEM models (Ullman, 2006), can be assumed.

It is also usual to represent distributions of samples through histograms. The histograms not only allow to easily see the distribution answers of the participants in respect to a specific measured variable, but also to understand possible effects of skewness or kurtosis. Furthermore, normal probability plots are also used to clarify potential skewness or kurtosis effects.

As the number of variables is large, only some of them will be commented below, as mere examples. For example, the first variable, the I01 item, corresponding to the base wages assessment, has an average of slightly more than 3 (neither agree, neither disagree) and a standard deviation of almost 1. It seems that the average of the respondents, corresponding to almost 40% of the respondents, when confronted with the question if their base wage is fair, they tend to neither agree, neither disagree. The average of this item is similar to the global assessment average of incentive. However, the average measure of base wages (contrary to the measure of the variable payment) seems relatively higher than the average of its latent variable, the compensation measure. This same item presents a skewness value near to zero and a slight negative kurtosis measure.

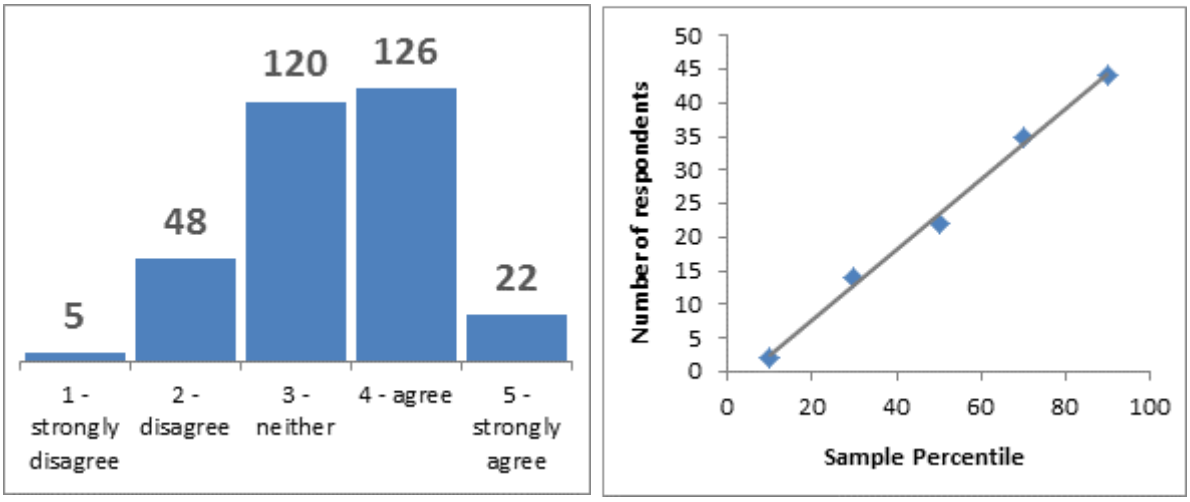


Figure 44: Histogram and normal probability plot of base wages assessment (I01 item)

The Figure 44 illustrates, on the left, a histogram representing the distribution of responses of I01 item in a very balanced way around the middle (characteristics of a skewness measure near to zero). Although a histogram of real data never look like a perfect normal distribution, this graph almost shows a standard bell curve (meaning of a small kurtosis). On the right, there is a normal probability plot confirming the normality distribution and showing that points appear to fall along a straight line.

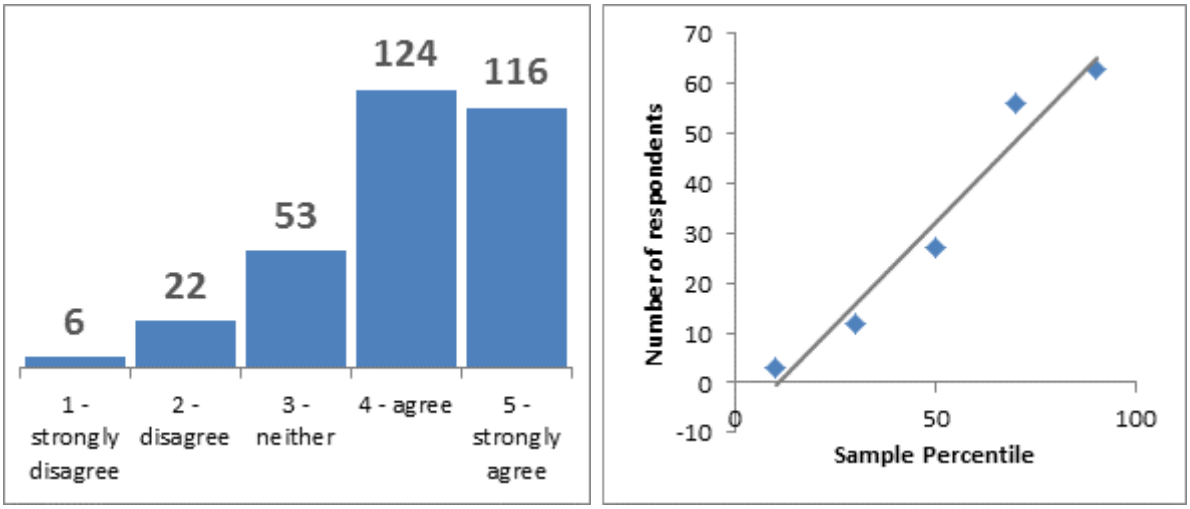


Figure 45: Histogram and normality plot of time off easiness (I14 item)

Looking to the Table 39, it is also possible to note that the majority of measured variables about incentives have their skewness measures with negative values. This means that most of these variables have their longer tail at their left side. For instance, the I14 item, which tries to measure the time off easiness, has a skewness measure near to -1. The average of this variable is very near to 4 (agree) and, on the one hand, the distance to its maximum limit, on your right (5 – strongly agree), is very short, and, on the other hand, the responses of other respondents are distributed on the left, in a gentle way, spreading the other answers through the remaining lower alternatives (3, 2 and 1). The Figure 45 shows a histogram and a normality plot of time off easiness (I14 item). Although the normal test plot also shows a slightly curve suggesting a possible long tail, it still does not compromises the rule of the thumb about kurtosis (it is positive, but its absolute value is lower than 3.0).

The Figure 46 represents the average assessment of the incentive dimensions maturities. The incentive dimensions of performance & recognition and development & career opportunities clearly emerge as the more mature dimensions, followed by the work-life dimension. The less mature dimensions are the compensation and the benefits.

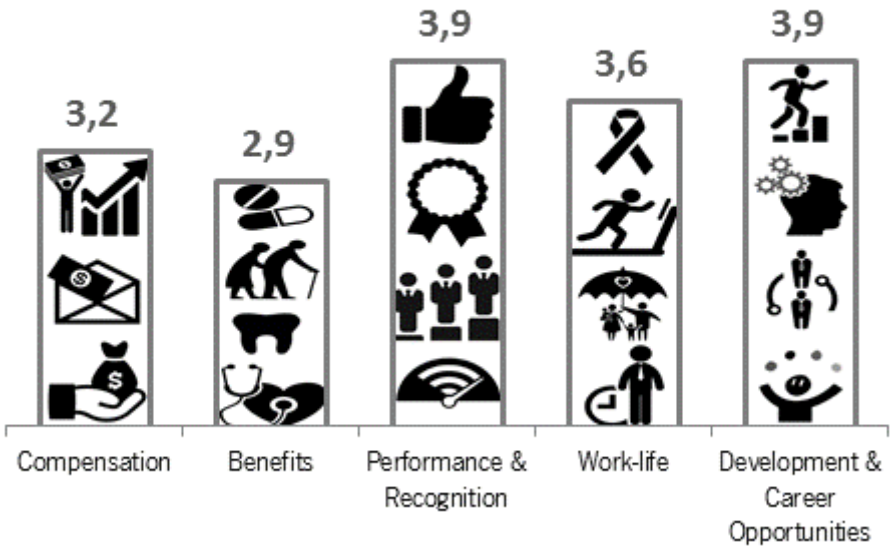


Figure 46: Average assessment of incentive dimensions maturities

Further on, the Table 40 presents the descriptive statistics for the 39 alignment's manifest variables. The averages and the standard deviations (variances) will also be commented at the next chapter. Again, as the number of alignment indicators is also large, only some of them will be commented below, particularly in relation to their skewness and kurtosis.

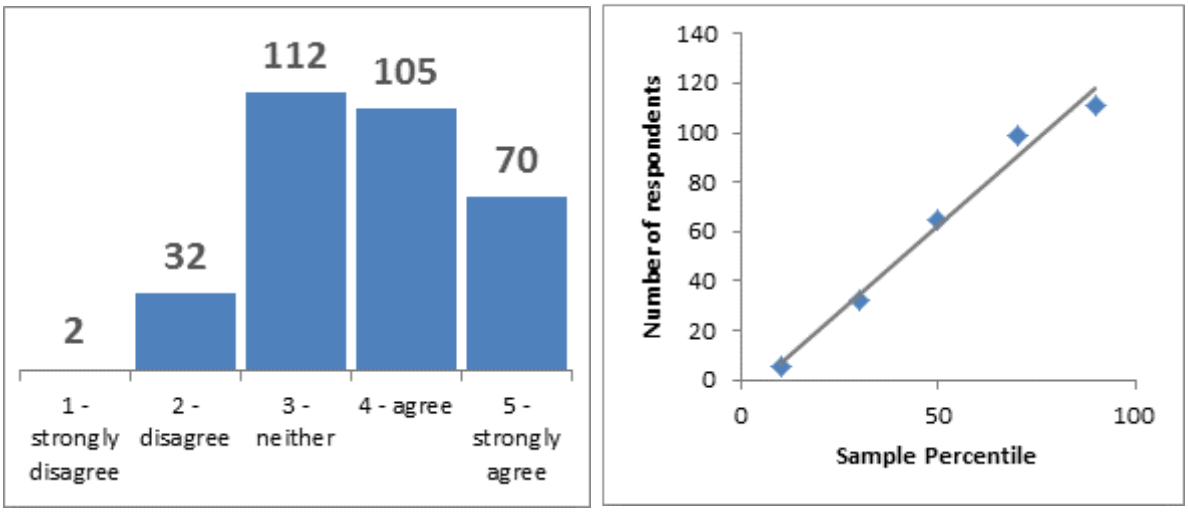


Figure 47: Histogram and normality plot of understanding of business by IT (A01 item)

For example, the first alignment indicator, the A01 item, corresponding to the assessment of the understanding of business by IT, has an average of approximately 3.66 (relatively close to 4) and a standard deviation of approximately 0.87. This same item presents a negative skewness and kurtosis

values near to zero. Like it was shown previously, the Figure 47 helps a sensibility analysis about this distribution, showing on the left, a histogram which represents the distribution of responses about this item, evidencing that most answers lie on otion 3 (neither agree, neither disagree) and 4 (agree).

Code	Description	Average	Standard Deviation	Variance	Skewness	Kurtosis
A01	Understanding of business by IT	3,6675	0,8707	0,7582	-0,3019	-0,1943
A02	Understanding of IT by business	3,2705	0,8136	0,6619	-0,1982	0,3917
A03	Organizational learning	3,2346	1,0667	1,1378	-0,1977	-0,1425
A04	Style and ease of access	3,8951	0,9350	0,8743	-1,0079	1,0100
A05	Leveraging intellectual assets	2,9485	1,0500	1,1025	-0,2275	-0,5003
A06	IT–business liaison staff	3,2291	1,0874	1,1824	-0,4274	-0,2519
A07	IT metrics	3,0318	1,1395	1,2984	-0,1372	-0,7398
A08	Business metrics	3,0341	1,0494	1,1013	-0,1167	-0,4820
A09	Link between IT and business metrics	3,1192	0,9793	0,9591	-0,2771	-0,1603
A10	Service level agreements	3,0334	1,1411	1,3020	-0,0916	-0,8751
A11	Benchmarking	3,1811	1,2394	1,5362	-0,2208	-1,0250
A12	Formally assess IT investments	3,2201	1,0460	1,0942	-0,1344	-0,4853
A13	Continuous improvement practices	3,5248	0,9090	0,8263	-0,4951	-0,0582
A14	Formal business strategy planning	3,3059	0,9097	0,8275	-0,2932	-0,1188
A15	Formal IT strategy planning	3,2956	0,8920	0,7956	-0,5909	0,2317
A16	Organizational structure	2,8695	0,9933	0,9866	-0,0919	-0,3240
A17	Reporting relationships	3,6288	1,3249	1,7555	-0,4790	-1,0633
A18	How IT is budgeted	3,3628	0,9337	0,8719	-0,6333	0,1814
A19	Rationale for IT spending	3,5175	1,0046	1,0092	-0,4403	-0,4621
A20	Senior-level IT steering committee	3,0129	0,9678	0,9366	-0,1339	-0,5341
A21	How projects are prioritized	3,3142	1,0742	1,1540	-0,9222	0,0282
A22	Business perception of IT	3,4083	1,0645	1,1331	-0,3717	-0,4259
A23	IT's role in strategic business planning	3,0104	1,0155	1,0312	-0,0838	-0,5858
A24	Shared risks and rewards	3,0175	1,0322	1,0654	-0,1930	-0,4257
A25	Managing the IT–business relationship	3,5581	1,0653	1,1349	-0,6184	-0,2414
A26	Relationship/trust style	3,3236	0,9740	0,9487	-0,0969	-0,3726
A27	Business sponsors/champions	3,3610	1,2820	1,6436	-0,4218	-0,8849
A28	Primary systems	3,1068	1,0390	1,0795	-0,2685	-0,2836
A29	Standards	3,4288	1,0739	1,1532	-0,8773	0,0929
A30	Architectural integration	3,2025	0,8267	0,6835	-0,3769	0,5738
A31	Infrastructure transparency	3,6333	1,0083	1,0166	-0,3616	-0,6866
A32	Infrastructure flexibility	3,5637	0,9850	0,9701	-0,2751	-0,7232
A33	Innovative, entrepreneurial environment	3,2421	0,9879	0,9760	-0,2927	-0,6845
A34	Key IT HR decisions made by:	3,1669	1,1036	1,2179	-0,5908	-0,4232
A35	Change readiness	3,4064	1,0920	1,1925	-0,5979	-0,2745
A36	Career crossover opportunities	2,4530	1,1794	1,3909	0,6244	-0,3986
A37	Cross-functional training & job rotation	2,7164	0,9486	0,8999	0,2573	-0,6560
A38	Social interaction	3,3380	0,9070	0,8227	-0,3837	-0,1070
A39	Attract and retain top talent	2,7559	1,0076	1,0153	0,3732	-0,3881

Table 40. Descriptive statistics for alignment's manifest variables

On the right, the Figure 47 shows a normality probability plot, showing a slight curve that may suggest a little left skewed effect (long tail to the left side). Yet, again, the rule of the thumb about skewness is not compromised, as its absolute value is still lower than 3.0, and so, this can be considered a minor effect.

Looking to another alignment indicator, the A36 item, which tries to measure the opportunities of career crossover, it is possible to see an average of about 2.5, a standard deviation of approximately of 1.2, a positive skewness near to +0.62 and a negative kurtosis close to -0.40. As it can be seen at Figure 48, either at the histogram or at the normality plot, the great majority of responses lie on option 1 (strongly disagree) and on option 2 (strongly disagree). Again, although it presents a slight long tail on the right and a distribution somewhat flat (negative kurtosis), it still does not compromise the rule of the thumb about skewness or kurtosis (both absolute values are lower than 3.0).

Now, based on the indicators averages presented at Table 39, it is possible to compute the assessment of each dimension maturity. For the purpose of an initial statistical analysis, and for now, the assessment of each dimension maturity is computed as the arithmetic average of all corresponding assumed indicators. Later, it will be noted that these averages may be calculated differently to the way they were here. As it is known, the PLS-SEM algorithm presupposes that the weights of each indicator and dimension may be different and so, the correspondent averages may vary in accordance.

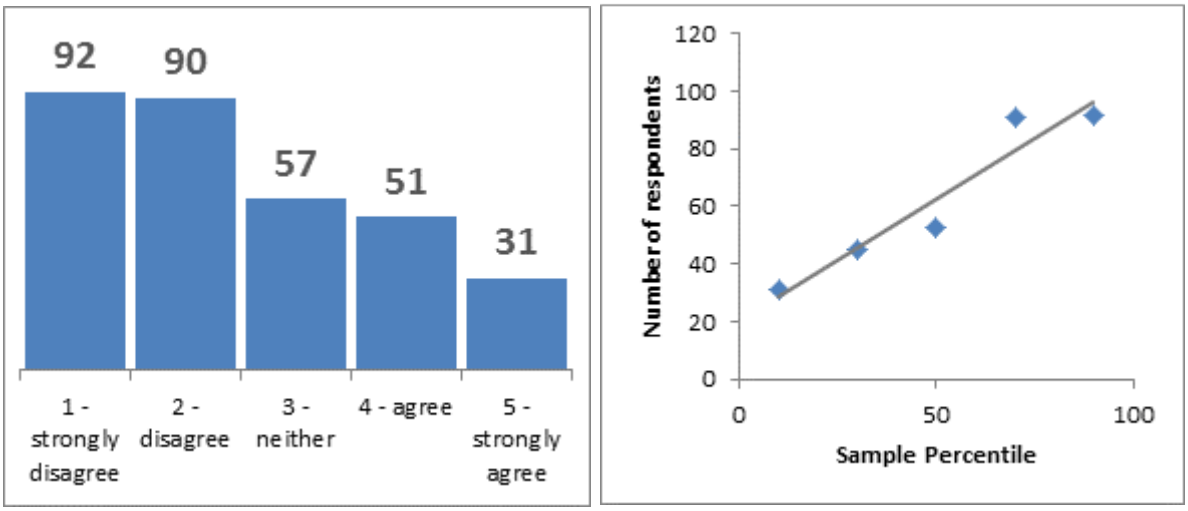


Figure 48: Histogram and normality plot of career crossover opportunities (A36 item)

Based on the indicators averages presented at Table 40, it is also possible to compute the assessment of each dimension maturity of alignment. The Figure 49 represents the average assessment of the alignment dimensions maturities.

As it can be observed, the differences among the different dimensions of the alignment are not as strong as those verified with the incentive dimensions. The technology scope emerges as the alignment dimension more mature, immediately followed by the other dimensions. The exception is the skills dimension that appears alone in last place.

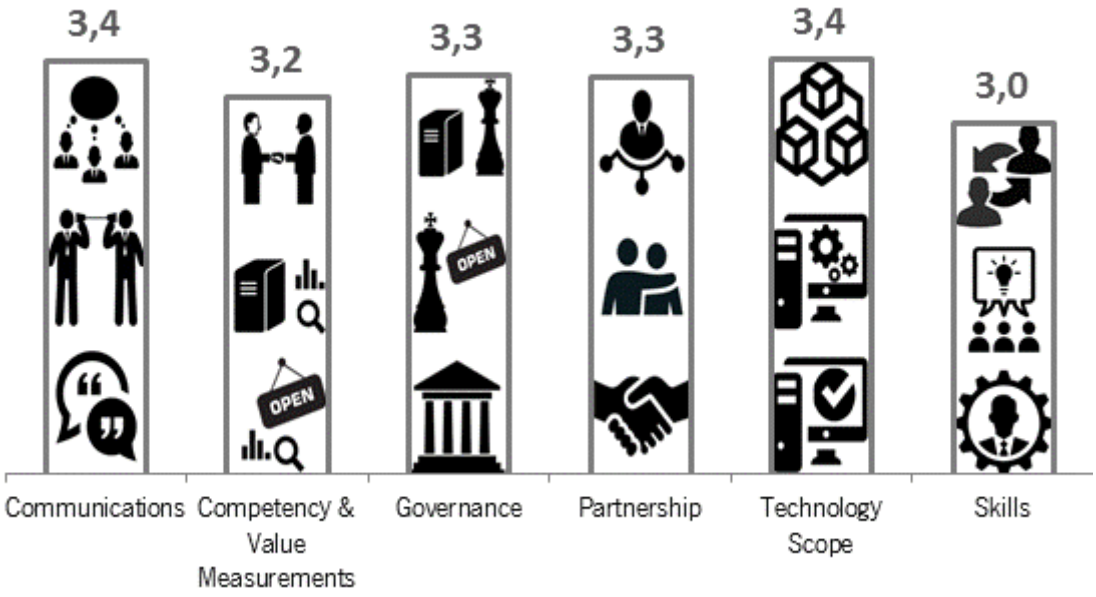


Figure 49: Average assessment of alignment dimensions maturities

Next, the maturities assessments of incentive and alignment dimensions are presented taking into account some companies' characteristics.

Code	Description	medium company	large company 250-999 employees	large company 1000-4999 employees	large company >=5000 employees	All
	number of enterprises:	83	70	48	37	238
	Incentive					
CMP	compensation	3,15	3,12	3,25	3,18	3,17
BNF	benefits	2,83	2,97	3,00	2,97	2,93
P&R	performance & recognition	3,89	3,89	3,91	3,76	3,88
WKL	work-life	3,60	3,60	3,52	3,49	3,56
D&C	development & career opportunities	3,86	3,90	3,95	3,75	3,87
	Global Assessment of Incentive	3,47	3,49	3,53	3,43	3,48
	Alignment					
COM	communications	3,33	3,42	3,45	3,27	3,37
C&V	competency & value measurements	3,01	3,19	3,28	3,30	3,16
GOV	governance	3,17	3,28	3,41	3,41	3,29
PRT	partnership	3,19	3,26	3,40	3,37	3,28
TEC	technology scope	3,37	3,35	3,41	3,45	3,39
SKL	skills	2,96	2,95	3,12	3,10	3,01
	Global Assessment of Alignment	3,17	3,24	3,34	3,32	3,25

Table 41. Average assessment of alignment dimensions maturities by companies' size

The Table 41 presents the average assessments of incentive and alignment dimensions of companies by their dimension. As it was explained before, large companies were spitted into 3 groups. It seems that medium companies have their managers slightly more motivated then at larger

companies. Also, it looks that the incentive maturity does not differ significantly among large companies with different sizes.

Moreover, it is also possible to see at Table 41, that bigger companies seem to be more aligned. From medium companies up to those companies with more than 5000 employees, it is observable that the bigger the company, the higher the alignment maturity. The only exception is relative to companies with more than 5000 employees that have a lower maturity when compared with companies with more than 1000 and less than 500 employees. Yet, as those maturities are very similar, so that can be neglected. The larger companies are, approximately, 5% more aligned than the medium sized companies.

4.4 Brief maturity assessment case

Assessing the alignment maturity of a particular company may be used for different purposes. First, according to Jerry Luftman, the great defender of the instrument adopted at this research to assess alignment, this tool offers a way to "evaluate where an organization is, and where it needs to go, to attain and sustain business–IT alignment". It also helps to identify specific actions that guarantee that IT is being used to appropriately enable or drive the business strategy (Luftman, 2003). Second, if the alignment maturity is assessed at different moments of the company life, it may be used to help to see the eventual progress in the correspondent period (Luftman et al., 2013). Finally, at a company, an alignment maturity assessment may be used to compare the evaluated organization with its competitors of the same type of business. It may underline weaknesses or strengths and so, it can help to define a strategy with underlying objectives that allow the company to evolve and gain a better strategic position in the market.

This section will show the case of a specific company, selected from the companies surveyed at this study, and that will be used as a brief example to demonstrate an assessment of business-IT alignment maturity. The organization discussed in this case is a large pharmaceutical manufacturing company. From here on, this organization is referred to as the "company".

Two managers answered the questionnaire at the company, one from the business side and the other one from the IT side, respectively the chief executive officer (CEO) and the chief information officer (CIO).

The Figure 50 presents the maturity assessment of all business-IT alignment indicators of the company. For each indicator, it also shows the overall average and the average for manufacturing industries. As it can be observed, most alignment indicators of the company present a higher value than either the manufacturing industry average or the overall average. Furthermore, it can be seen that most alignment indicators for manufacturing industry companies have, usually, an average assessment above the overall average.

A closer analysis of each alignment indicator evidences two significant low indicators averages. The A36 item, relatively to career crossover opportunities presents an average of 1.5, with one respondent answering that the job transfer rarely occurs (option 1), and another respondent, answering that job transfers occasionally occur within unit (option 2).

Similarly, the A39 item, relative to the attraction and retention of top talent, presents a very low average of 1.5. Here, with one respondent answering that no retention program exists or that there is a poor recruiting program (option 1), and another respondent, answering that IT hiring is focused on (just) technical skills (option 2).

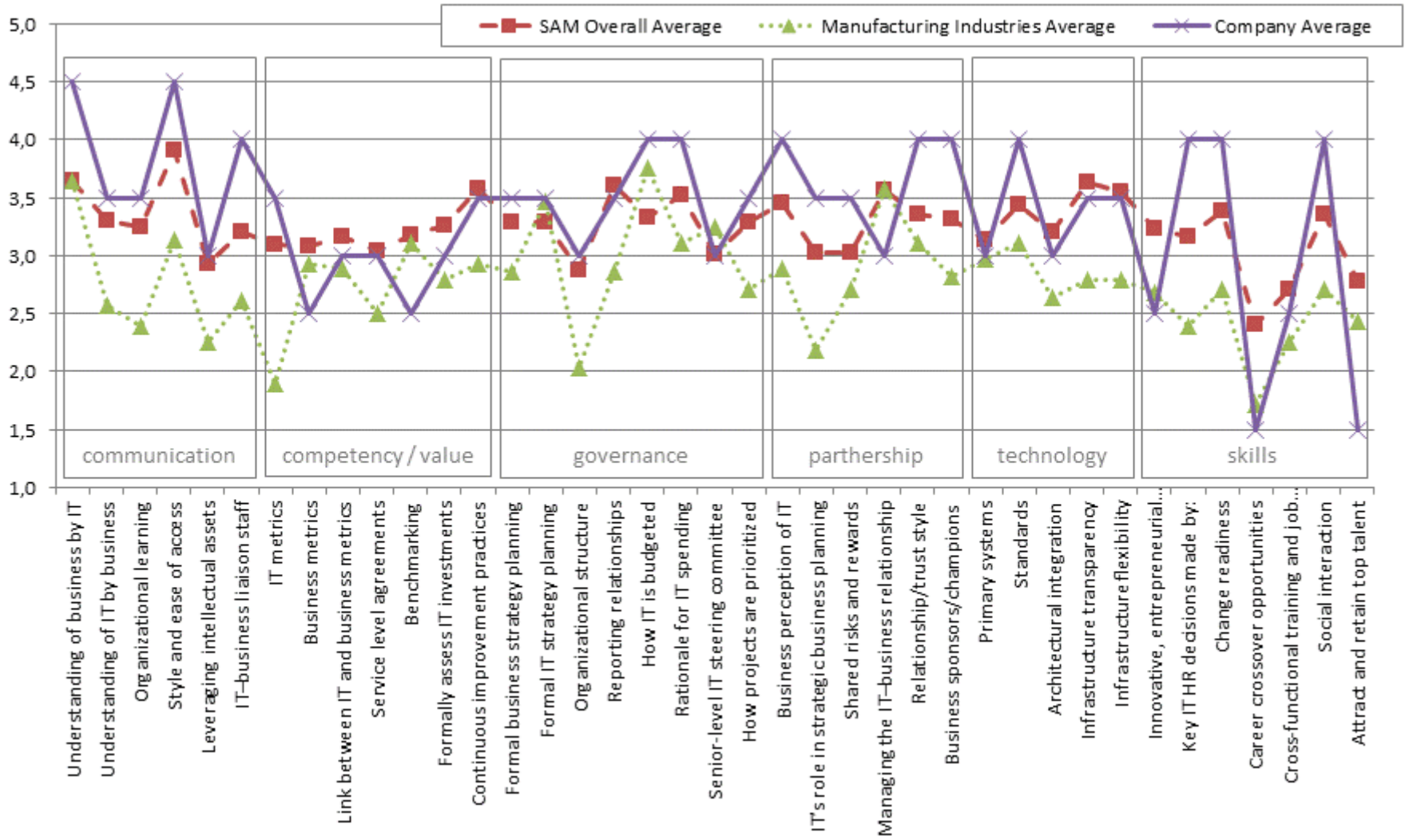


Figure 50: Maturity assessment of business-IT alignment of a large Portuguese pharmaceutical manufacturing company

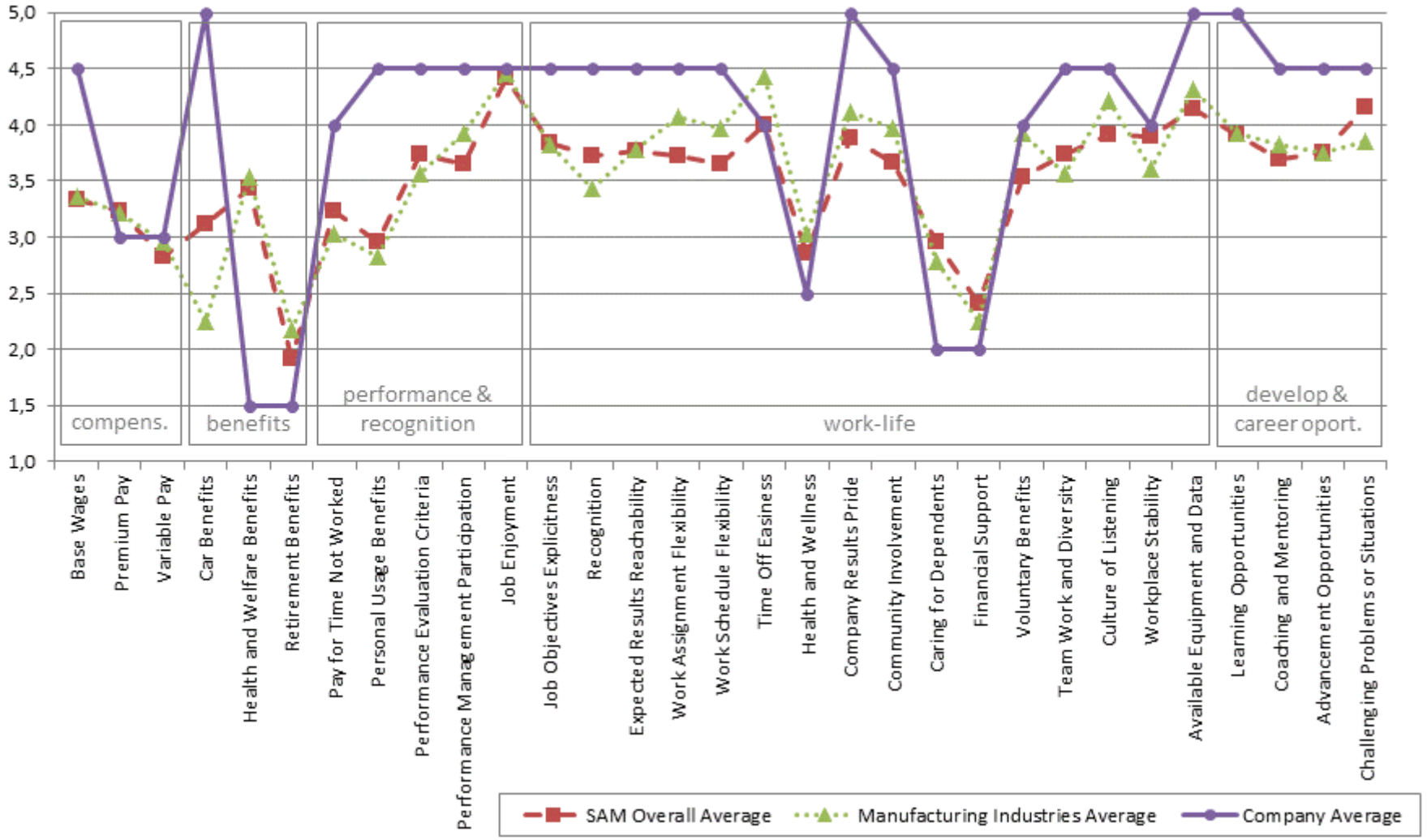


Figure 51: Maturity assessment of incentive of a large Portuguese pharmaceutical manufacturing company

These two values reveal that both management practices behind these two indicators may be improved, representing opportunities to define new specific objectives for the company.

On the opposite side, the A01 item, concerning the understanding of business by IT and the A04 item, relative to the style and ease of access reveal a very mature facet of the alignment. Both these two indicators have an average of 4.5. At A01 item, one respondent answered that the business understanding is encouraged among IT staff (option 4), and another respondent answered that the business understanding is required to all IT staff (option 5). At A04 item, one respondent answered that communication between business and IT occurs on a two-way, somewhat informal in addition to a formal way (option 4), and another respondent answered that communication occurs in a two-way, besides the formal way, also informal, and flexible, as a complement to formal (option 5).

In short, this brief maturity assessment case of a business-IT alignment of a large pharmaceutical manufacturing Portuguese company shows that the assessment of an organization alignment maturity can be used as part of a process that can bring up opportunities to improve the organization and its management practices. As it was previously presented at Figure 14, Jerry Juftman and Tom Brien even proposed a six-step process approach that was designed to make the strategic alignment work in an organization (Luftman & Brier, 1999). In a hypothetical scenario, this alignment process could be implemented at this company, and help it to clearly assess the current status of its alignment maturity (this survey assessed the maturity of this company as 3,37), analyse and prioritize gaps (the Figure 1 reveals the most important problems of the alignment at this company and its distances to the industry averages), specify a strategy, an action plan and sustain it. Taking into account the Cobit approach (ITGI, 2007), the Figure 52 presents a graphic representation of the alignment maturity of the analysed large Portuguese pharmaceutical manufacturing company, the alignment average of its industry (3.08) and a possible specification of the company target for the alignment (like 4,0).

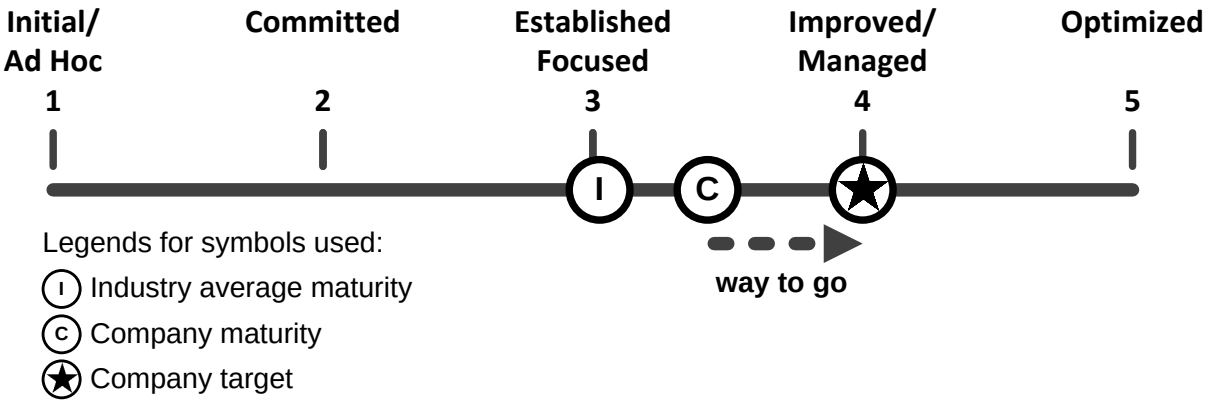


Figure 52: Hypothetical graphic representation of a simplified maturity model of a large Portuguese pharmaceutical manufacturing company

As it is supported in this thesis, the incentives may help a company in diverse objectives, and particularly, they may play an important role in improving the alignment. So, similarly as it was done for the alignment, the maturity of incentive can also be assessed for this particular company.

The Figure 51 presents the maturity assessment of incentive of the same large pharmaceutical manufacturing company analysed in this section. As it happened with the alignment indicators, most incentive indicators at this company have a higher average compared to the overall or the specific manufacturing industries companies. Yet, contrary to the alignment indicators, it seems there is no clear difference on incentives among the the manufacturing industries companies and all the other companies in general. Again, the assessment exercise allows the awareness about certain aspects of incentives that can be improved. At this company, the incentive indicators with lower averages are the I05 item (health and welfare benefits), the I06 item (retirement benefits), the I18 item (caring for dependents) and the I19 item (financial support). Both the first two indicators have 1.5 on average and the second two have 2.0.

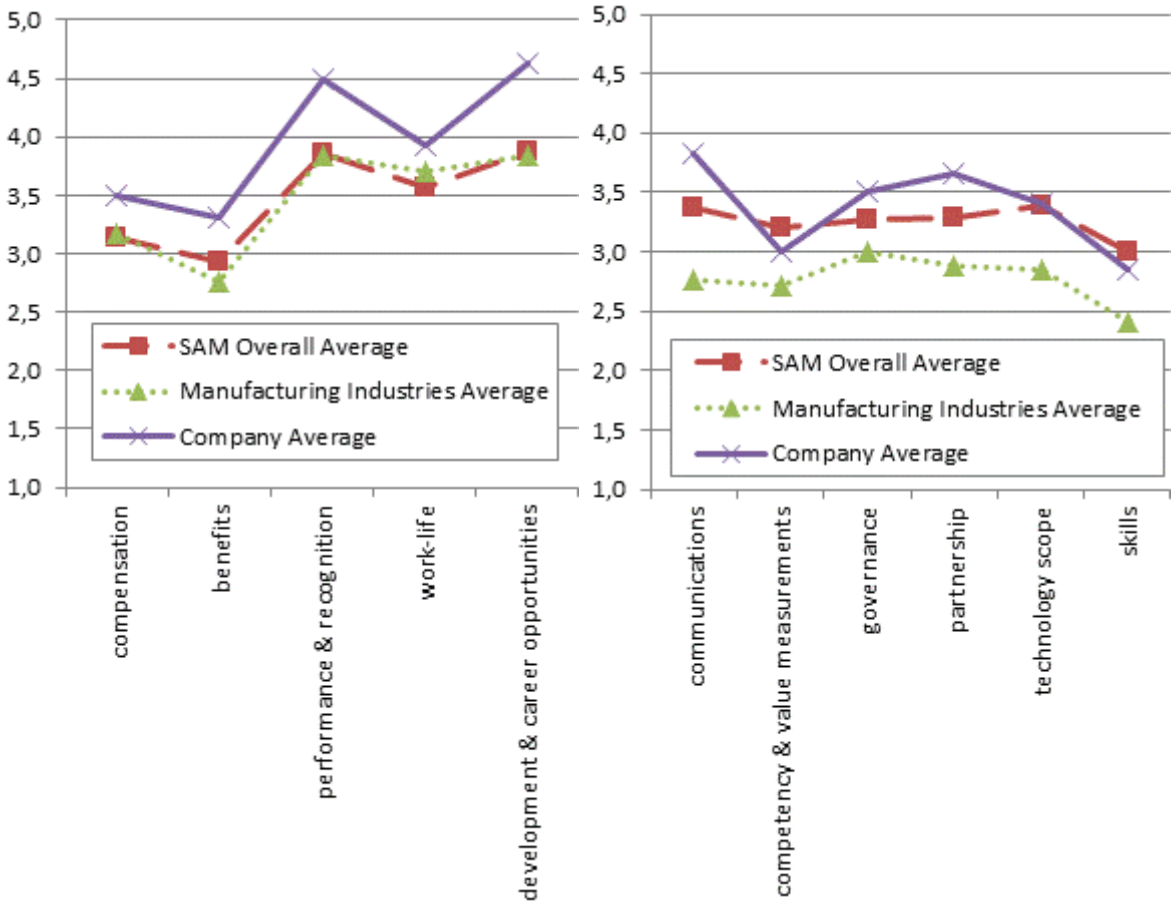


Figure 53: Maturity assessment averages of incentives and business-IT alignment dimensions of a large Portuguese pharmaceutical manufacturing company

The Figure 53 summarizes the maturity assessment averages of the analysed company, presenting the maturities of each incentive dimension (on the left) and the maturities of each business-IT alignment dimension (on the right) of this company. These maturities are compared with the overall average and the average of the manufacturing industry companies. The assessment of each dimension maturity was computed as the arithmetic average of the correspondent surveyed companies.

In the same way, it can be easily verified that this company exceeds the maturities of all incentive dimensions and all business-IT alignment dimensions for the average of the manufacturing

companies. Just when comparing with the overall alignment average, there are two dimensions where this company falls short. These dimensions are the competency & value measurements and the skills. Probably, these two areas could be identified as gaps that should be corrected and consequently, that can support the definition of a specific strategy with a correspondent action plan in order to achieve and sustain a better company alignment (Luftman & Brier, 1999). Of course that, a more precise analysis and a more correct interpretation to the diverse management practices of this company that derive from all the indicators maturity assessment can be more correctly done with the help of an inside team, with elements carefully chosen, either from the business or the IT side, as Luftman and Brier argued.

4.5 Model assessment results

The model was operationalized through a hierarchical component model (HCM) constituted by two types of elements. These two types of elements are higher-order components (HOC) that capture more abstract entities, and lower-order components (LOC), that capture the subdimensions of the abstract entities. At hierarchical component models, it is recommended a two-stage approach, where the first stage is supported on repeated indicators usage by LOCs and the correspondent HOCs variables and where the second stage is based on the usage of latent variable scores to estimate the final HOCs (Hair et al., 2014; Christian M. Ringle et al., 2012; Wetzels, Odekerken-Schröder, & Van Oppen, 2009).

Using a bottom-up approach, the underlying model to this research has lower-order components (LOC) elements, constituted by all the 11 subdimensions of the two general constructs (the incentive and the alignment), respectively the compensation (CMP), benefits (BNF), performance & recognition (P&R), work-life (WKL), development & career (D&C), communications (COM), competency & value measurements (C&V), governance (GOV), partnership (PRT), technology (TEC) and the skills (SKL). Then, the model has higher-order components (HOC) capturing more abstract entities, respectively, the incentive and the alignment.

Also, at PLS-SEM, the evaluation of the measurement and structural model results are based on a set of nonparametric evaluation criteria, using procedures such as bootstrapping. This evaluation follows a two-step process, where the first step involves a separate assessment of the measurement models and the second step involving the assessment of the structural model (Hair et al., 2014).

So, this section is organized as follows. First, the next two sections will present the measurement and structural model assessments of the lower-order components (LOC). Then, the subsequent two sections will present the same assessments, but for the higher-order components (HOC).

(a) Assessment of the measurement model of the lower-order components

The structural equation modelling with partial least squares (SEM-PLS) method was used to examine the relationship and causal effects of the proposed model (Hair et al., 2014; Hair et al., 2011; Hair, Sarstedt, Pieper, & Ringle, 2012).

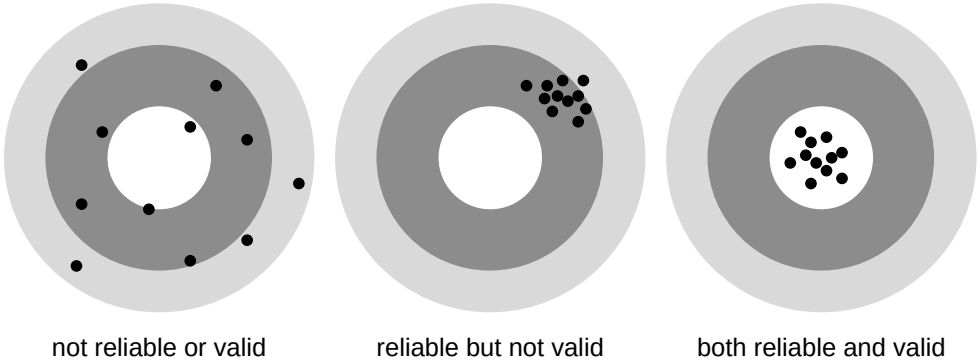


Figure 54: Not reliable or valid, reliable but not valid and both reliable and valid examples

The measurement model was evaluated relatively to its reliability and construct's validity (Wong, 2013). These two concepts are very important and there are several methods to assess both reliability and validity in social science research. The Figure 54 illustrates the reliability and validity concepts with three different situations regarding a construct that is measured by several indicators (black points). The first situation (on the left) corresponds to a not reliable or valid example, the second to a reliable but not valid and the third situation corresponds to a situation both reliable and valid.

Briefly, the reliability regards consistency or stability of measurement over a variety of conditions in which basically the same results should be obtained. Moreover, validity concerns the meaningfulness of constructs and whether an instrument is measuring what it is intended to measure (Drost, 2011). Yet, although an instrument can be reliable and not valid, it requires reliability to be valid. For example, a scale that is erroneously calibrated, may return consistently the same values, even though without accuracy (Kimberlin & Winterstein, 2008). On the other hand, as the validity corresponds to the degree to which any measurement or instrument succeeds in describing or quantifying what it is designed to measure, an unreliable instrument have necessarily higher errors and consequently, lower validity degree. So, validity needs reliability.

Construct	Item	Outer loading	Internal reliability	Cronbach alpha	Composite reliability	AVE	AVE-1
CMP	I01	0,745	0,555	0,780	0,873	0,697	0,835
	I02	0,861	0,741				
	I03	0,893	0,797				
BNF	I04	0,740	0,547	0,741	0,828	0,494	0,703
	I05	0,608	0,370				
	I06	0,628	0,394				
	I29	0,678	0,460				
	I30	0,836	0,699				
P&R	I07	0,758	0,575	0,861	0,897	0,595	0,771
	I08	0,794	0,630				
	I09	0,589	0,347				
	I10	0,808	0,653				
	I11	0,841	0,707				
	I31	0,812	0,659				
WKL	I12	0,609	0,371	0,893	0,910	0,444	0,666
	I13	0,595	0,354				
	I14	0,559	0,313				
	I15	0,612	0,374				
	I16	0,703	0,495				
	I17	0,746	0,557				
	I18	0,638	0,407				
	I19	0,457	0,209				
	I20	0,666	0,443				
	I21	0,807	0,651				
	I22	0,816	0,666				
	I23	0,633	0,401				
	I24	0,725	0,526				
D&C	I25	0,869	0,755	0,883	0,920	0,741	0,861
	I26	0,878	0,770				
	I27	0,912	0,831				
	I28	0,780	0,609				

Table 42. Measurement results for the outer model of the incentive domain

Table 42 and Table 43 respectively present the measurement results for the outer model regarding the incentive domain and the alignment domain parts.

Construct	Item	Outer loading	Internal reliability	Cronbach alpha	Composite reliability	AVE	AVE-1
COM	A01	0,684	0,468	0,837	0,880	0,552	0,743
	A02	0,686	0,470				
	A03	0,763	0,582				
	A04	0,765	0,585				
	A05	0,719	0,517				
	A06	0,830	0,689				
C&V	A07	0,829	0,686	0,920	0,936	0,676	0,822
	A08	0,852	0,725				
	A09	0,857	0,734				
	A10	0,828	0,686				
	A11	0,755	0,569				
	A12	0,848	0,719				
	A13	0,780	0,608				
GOV	A14	0,807	0,652	0,896	0,918	0,585	0,765
	A15	0,862	0,742				
	A16	0,751	0,565				
	A17	0,545	0,297				
	A18	0,728	0,530				
	A19	0,761	0,579				
	A20	0,814	0,662				
	A21	0,808	0,652				
PRT	A22	0,805	0,648	0,882	0,911	0,630	0,794
	A23	0,847	0,717				
	A24	0,772	0,595				
	A25	0,839	0,704				
	A26	0,782	0,611				
	A27	0,711	0,505				
TEC	A28	0,763	0,582	0,854	0,896	0,632	0,795
	A29	0,770	0,592				
	A30	0,809	0,655				
	A31	0,813	0,660				
	A32	0,818	0,669				
SKL	A33	0,782	0,611	0,861	0,895	0,551	0,742
	A34	0,562	0,316				
	A35	0,792	0,626				
	A36	0,740	0,547				
	A37	0,771	0,595				
	A38	0,707	0,499				
	A39	0,812	0,659				

Table 43. Measurement results for the outer model of the alignment domain

(a.i) Indicator reliability

The first values presented at this table are the outer loadings. When there is a reflective measurement model, like the one at this study relating the indicators with the first order latent variables, the load coefficients are known as outer loadings (l_i) and are estimated through single regressions of each indicator variable, as independent variable, on its respective construct, as dependent variable (one regression for each indicator variable). If, on the contrary, it is a formative measurement model, then the latent variables would be independent, the indicators dependent, and the load coefficients would be known as outer weights (w_i) and estimated by a partial multiple regression (Hair et al., 2014).

At reflective models, high outer loadings on a construct indicate that the associated indicators have much in common with that construct. This characteristic, captured by the construct, is usually called the indicator reliability (Hair et al., 2014). The indicator reliability of each item corresponds to the square of its outer loadings value. At confirmatory research, this indicator should be 0.70 or higher. With new items or when newly developed scales are employed (exploratory research), like those at the incentive domain of this study, a value of 0.40 or higher is acceptable (Hulland & Business, 1999).

Based on this rule of thumb, almost all items survive. Among 23 items of the incentive domain, there are 8 exceptions which are the items I05, I06, I09, I12, I13, I14, I15 and I19. Relatively to the alignment domain, there are 2 exceptions; the items A17 and A34.

(a.ii) Internal consistency reliability

The measure of how well the items on a test measure a same construct (or latent variable) is called the internal consistency reliability. The internal consistency reliability of a construct is traditionally tested using the Cronbach alpha value. As it was already presented before, a commonly accepted rule defines a minimum alpha coefficient of 0.7 for mature research tools, but it is also acceptable a minimum Cronbach's Alpha value of 0.5 at preliminary researches (DeVon et al., 2007; Peterson, 1994). As it can be seen at Table 42 and, according to the defined rule, all the six constructs accomplished the minimum required.

Yet, although Cronbach alpha still represents a conservative measure of internal consistency reliability, it doesn't take into account the different outer loadings of the indicator variables and so, it is more suitable to apply a different measure. The composite reliability does not assume equal indicator loadings like the Cronbach alpha and so, in the context of PLS-SEM, this alternative measure is a more appropriate criterion of reliability (Hair et al., 2014).

$$\rho_c = \frac{(\sum_i l_i)^2}{(\sum_i l_i)^2 + \sum_i var(e_i)}$$

Equation 8: The composite reliability formula

The Equation 8 presents the composite reliability formula, where l_i means the standardized outer loading of the indicator i of a specific construct, e_i is the measurement error of the indicator variable i, and $var(e_i)$ represents the variance of the measurement error, defined as $1 - l_i^2$.

The rule of thumb for the internal composite reliability defines that this value should be 0.7 or higher for confirmatory researches or a minimum of 0.6 for exploratory researches (Bagozzi & Yi, 1988). Furthermore, this value should not exceed 0.95 (Hair et al., 2014). According to this rule, all the constructs of the incentive and alignment domains are comfortably above 0.7 and so, they may be accepted.

(a.iii) Convergent validity

Different indicators of a reflective construct are seen as different approaches to measure a single construct. The positive correlation of these alternative measures associated with the same construct is called the convergent validity. The convergent validity may be checked by the average variance extracted (AVE) that is defined by Equation 9, where l_i is the indicator loading and Θ_i is the error variance of the i^{th} indicator of a total of n indicators.

$$AVE = \frac{\sum_i^n {l_i}^2}{\sum_i^n {l_i}^2 + \Theta_i}$$

Equation 9: The average variance extracted (AVE) formula

If all the indicators are standardized (i.e., have a mean of 0 and a variance of 1), the formula is simplified to Equation 10. The average variance extracted is a measure of convergent validity, that quantities the degree to which a latent construct explains the variance of its indicators (Hair et al., 2014).

$$AVE = \frac{\sum_i^n {l_i}^2}{n}$$

Equation 10: The simplified average variance extracted (AVE) formula

Normally, as it is acceptable to have a latent variable explaining more than half of the variance of its indicators, an AVE value of 0.50 or higher is a minimum value acceptable to the convergent validity of a latent variable (Hair et al., 2014). Examining the five latent variables presented at Table 42, there are 2 that have their AVE values lower than 0.50. These variables are the benefits and the work-life.

The deletion of indicators may be a possibility, especially if it allows the improvement of AVE numbers and so, the convergent validity. According to best practices, if the outer loading relevance testing is higher than 0.40 and lower than 0.70, the deletion may be done. Otherwise, the reflective indicator should not be deleted (Hair et al., 2014).

According to this procedure, if the I05 and I06 items are removed then the AVE value of the benefits construct becomes 0.65 instead of 0.49. Also, if I12, I13, I14, I15 and I19 items are removed, the AVE value of the work-life construct becomes 0.54 instead of 0.44. With this procedure, the convergent validity of all incentive constructs may be assured. Fortunately, even after this removal, these constructs seem to still have enough number of indicators in order to guarantee their content validity.

Concerning the latent variables of the alignment domain, all of them have their AVE values below 0.50, as it can be seen at Table 43. Consequently, they can all be considered valid in terms of convergency, and so, can be accepted.

(a.iv) Discriminant validity

The degree to which a construct is really different from other constructs is called the discriminant validity. When a certain construct has this type of validity, it denotes that it is unique and that the phenomena it captures are not represented by other constructs in the model (Hair et al., 2014).

One method for assessing discriminant validity is the Fornell-Larcker criterion. This method compares the square root of the AVE values with the correlations among the latent variables. If the square root of the AVE of each construct is greater than the highest correlation between that construct with any other construct, then the discriminant validity is accepted (Hair et al., 2014).

	BNF	C&V	CMP	COM	D&C	GOV	P&R	PRT	SKL	TEC	WKL
BNF	0,8094										
C&V	0,3852	0,8219									
CMP	0,5984	0,4158	0,8350								
COM	0,4544	0,7221	0,5099	0,7430							
D&C	0,4831	0,4487	0,5393	0,6484	0,8610						
GOV	0,4137	0,7738	0,4501	0,7521	0,5372	0,7945					
P&R	0,5688	0,5184	0,6052	0,6349	0,7424	0,5499	0,8101				
PRT	0,4298	0,7669	0,4374	0,7377	0,544	0,8264	0,6066	0,7938			
SKL	0,4249	0,7399	0,4651	0,7105	0,5589	0,7308	0,554	0,7896	0,7752		
TEC	0,3823	0,7311	0,4198	0,6426	0,4594	0,7102	0,4655	0,7374	0,7321	0,7948	
WKL	0,5066	0,4981	0,5211	0,657	0,8072	0,5413	0,7657	0,5503	0,548	0,4623	0,7405

Table 44. Latent variables correlations and AVE square root for each of first order constructs

The Table 44 presents the AVE values on the diagonal line and the correlations among each pair of latent variables. As it can be seen, all correlations are positive, as it was expected, indicating positive linear relationships. Some of these correlations, higher than 0.70, indicate strong positive relationship between those two variables and may reveal advantages of using higher-orders constructs. For example, these are the cases of relations between development & career (D&C) with performance & recognition (P&R) and work-life (WKL) at the incentive domain and also the relations of governance (GOV) with communications (COM), partnership (PRT), skills (SKL) and with technology (TEC) at alignment domain.

According to the Fornell-Larcker criterion, the correlations of all latent variables with each other were compared with the correspondent square roots of the AVE values presented at Table 42 and Table 43. Variables COM, GOV, PRT, SKL and WKL do not meet the Fornell-Larcker criterion. The others do.

Another common measure to asses the discriminant validity is based on the examination of the cross loadings of the indicators. This criterion states that all indicator's outer loadings associated to a

certain construct should be greater than all of its loadings on other constructs (i.e., the cross loadings) (Hair et al., 2014).

The Appendix 14 presents the cross loadings among all the indicators. Using this alternative method, it is possible to detect those indicators that do not accomplish the criterion of cross loadings comparison. This approach confirmed that variables COM, GOV, PRT, SKL and WKL had at least one indicator that did not meet the criterion. The examination of cross loadings allowed the detection of 12 indicators which failed among all the 70 indicators. The item A17 item from GOV's construct, the item A27 item from PRT, the item A34 item from SKL, the items I05 and I06 from BNF, the items I09 from P&R, the items I12, I13, I14, I15, I18 and I19 from WKL's construct failed to meet this criterion. All the other indicators succeeded.

Because items I05, I06, I09, I12, I13, I14, I15, I19, A17 and A34 bring convergent or discriminant validity problems, they were removed from the model. Even so, the model was tested again and still presented discriminant validity problems with 3 constructs (GOV, PRT, WKL). The Appendix 15 presents the table with cross loading of the indicators after the mentioned items have been removal.

The analysis of the indicators of governance (GOV) and partnership (PRT) in detail allowed seeing two possible problems with their indicators. Although the A23 item (IT's role in strategic business planning) has a high correlation with partnership construct, it also has a high multicollinearity with governance. Also, A18 item (how IT is budgeted) is the indicator with the lowest correlation with the governance construct. In order to try to get discriminant validity of governance construct, it was decided to remove the A18 item and not the A23, not only because A18 is the least correlated indicator with governance, but also because the A23 item is the second most correlated with partnership construct.

As it can be seen at Appendix 15, the A27 item (business sponsors/champions technology scope) is the indicator with the lowest correlation to partnership construct (PRT). It even manages to have a lower correlation with the partnership than the indicator A12 (formally assess IT investments). In order to try to get discriminant validity of partnership construct, it was decided to remove the A27 item.

Relatively to worklife construct (WKL), the items I18 (caring for dependents), I20 (voluntary benefits) and I23 (workplace stability) seem to have a low correlation with this latent variable. Indeed, items I25, I26 and I27 proposed to measure the construct concerning the development & career opportunities seem to be more correlated with worklife than the items I18, I20 and I23. The other five observed variables measuring the worklife construct seem considerable correlated with it. Consequently, it was decided to remove I18, I20 and I23 items.

After the removal of these items, the model was tested again. Fortunately, there was a sufficient margin of items so that, even after the successive removals of some of them, each construct is still at least measured by three items. The Table 46 and Table 45 present the cross loadings among all the indicators of that test.

	BNF	C&V	CMP	COM	D&C	GOV	P&R	PRT	SKL	TEC	WKL
I01	0,4408	0,3233	0,7386	0,4145	0,4031	0,3312	0,4288	0,3374	0,3960	0,3157	0,3852
I02	0,4894	0,3267	0,8643	0,4076	0,4609	0,3972	0,5048	0,3627	0,3424	0,3176	0,4231
I03	0,5637	0,3879	0,8942	0,4549	0,4832	0,3993	0,5724	0,3867	0,4262	0,4118	0,4630
I04	0,8122	0,2872	0,5409	0,3419	0,3580	0,3028	0,4812	0,3206	0,2932	0,2809	0,4148
I29	0,7399	0,2958	0,3746	0,3285	0,3266	0,2928	0,3489	0,3076	0,2950	0,3141	0,2741
I30	0,8708	0,3499	0,5214	0,4239	0,4714	0,3929	0,5287	0,4004	0,4274	0,3366	0,4743
I07	0,4208	0,3775	0,4967	0,4735	0,5390	0,3719	0,7724	0,4224	0,4220	0,3164	0,5863
I08	0,4466	0,4545	0,4580	0,5132	0,6019	0,4579	0,7857	0,4999	0,4393	0,3671	0,6273
I10	0,4647	0,4648	0,5103	0,5380	0,6236	0,4904	0,8204	0,5149	0,5066	0,4364	0,5850
I11	0,5301	0,4010	0,5213	0,5250	0,6196	0,4203	0,8447	0,4768	0,4375	0,4030	0,6989
I31	0,4378	0,4044	0,4645	0,5229	0,6213	0,5232	0,8254	0,4893	0,4395	0,3599	0,6406
I16	0,3930	0,3794	0,3476	0,4376	0,5927	0,3760	0,5538	0,3923	0,3710	0,3469	0,7805
I17	0,3667	0,3791	0,3837	0,4889	0,5933	0,4038	0,6064	0,4146	0,3669	0,2965	0,8212
I21	0,4600	0,4653	0,5354	0,6371	0,6636	0,5135	0,6729	0,4970	0,5319	0,4093	0,8215
I22	0,4291	0,3949	0,4272	0,5627	0,7055	0,4622	0,7317	0,4662	0,4505	0,3541	0,8486
I24	0,3196	0,4174	0,3418	0,5129	0,6541	0,4581	0,5463	0,4565	0,4440	0,4039	0,7606
I25	0,4230	0,4159	0,4811	0,5978	0,8685	0,4830	0,6550	0,4880	0,5070	0,4228	0,7285
I26	0,4297	0,4190	0,4793	0,5641	0,8774	0,4859	0,6616	0,4541	0,4890	0,4461	0,6922
I27	0,4122	0,3781	0,4769	0,5769	0,9111	0,4832	0,6658	0,4691	0,4973	0,3741	0,7152
I28	0,3973	0,3277	0,4168	0,4884	0,7818	0,4285	0,5704	0,4223	0,4276	0,3349	0,6017

Table 45. Cross loadings of incentives indicators of the final measurement model version

As it can be seen at Table 45, all incentive indicators associated to a certain construct are greater than all of its loadings on other constructs (i.e., the cross loadings) (Hair et al., 2014). The same happens with the alignment indicators at Table 46. So, as this criterion is fulfilled, it can be accepted the discriminant validity of this last version of the measurement model.

	BNF	C&V	CMP	COM	D&C	GOV	P&R	PRT	SKL	TEC	WKL
A01	0,3209	0,4404	0,3247	0,6810	0,4662	0,5703	0,3904	0,5363	0,4707	0,4506	0,4602
A02	0,2597	0,4288	0,3401	0,6858	0,4292	0,4546	0,4202	0,4829	0,4406	0,4098	0,4243
A03	0,3742	0,5827	0,4718	0,764	0,4607	0,5709	0,4914	0,5408	0,5816	0,5132	0,4609
A04	0,3527	0,4931	0,3512	0,7643	0,464	0,5478	0,4545	0,5519	0,4734	0,4376	0,473
A05	0,3005	0,6201	0,3529	0,7216	0,5057	0,5116	0,5200	0,5384	0,5861	0,4704	0,4947
A06	0,3992	0,6246	0,4174	0,8303	0,5542	0,6515	0,5390	0,6334	0,5934	0,5647	0,6018
A07	0,2821	0,8282	0,3019	0,6229	0,3767	0,6379	0,4050	0,6397	0,5971	0,5891	0,3785
A08	0,2828	0,8515	0,2933	0,5554	0,3457	0,6114	0,4043	0,5966	0,5703	0,5746	0,4272
A09	0,3201	0,8567	0,3715	0,6048	0,3462	0,6508	0,3897	0,6536	0,6224	0,6331	0,3729
A10	0,3382	0,8282	0,3397	0,5918	0,3381	0,6045	0,4049	0,5595	0,6187	0,6163	0,3989
A11	0,3737	0,7549	0,3446	0,531	0,3401	0,6343	0,4427	0,6194	0,5478	0,5679	0,3939
A12	0,3668	0,8477	0,4062	0,6233	0,3941	0,7054	0,4542	0,7085	0,7028	0,6761	0,4455
A13	0,2457	0,7803	0,3253	0,6241	0,4416	0,5693	0,487	0,5958	0,5855	0,5373	0,4921
A14	0,3341	0,6263	0,387	0,6724	0,5332	0,8195	0,5052	0,6411	0,5746	0,5774	0,5180
A15	0,3772	0,6724	0,4184	0,6385	0,4844	0,8691	0,5007	0,6804	0,5882	0,5657	0,5066
A16	0,3227	0,6155	0,3142	0,5462	0,3373	0,7659	0,3514	0,6302	0,5794	0,5393	0,3730
A19	0,3223	0,5538	0,3641	0,6266	0,4729	0,7783	0,4935	0,6456	0,6508	0,5688	0,4356
A20	0,2685	0,6651	0,319	0,5528	0,3822	0,812	0,432	0,7001	0,5943	0,5745	0,4209
A21	0,3732	0,6028	0,3906	0,5875	0,4441	0,8159	0,4317	0,6673	0,5514	0,589	0,4183
A22	0,3319	0,5929	0,3835	0,6232	0,3869	0,7073	0,4261	0,8293	0,6252	0,5744	0,4100
A23	0,3694	0,6222	0,333	0,6421	0,4528	0,7597	0,4406	0,8559	0,6542	0,5921	0,4306
A24	0,3501	0,5885	0,3853	0,5267	0,4229	0,6053	0,529	0,7771	0,6414	0,5419	0,4356
A25	0,366	0,6682	0,3529	0,6185	0,4659	0,6667	0,5294	0,8435	0,6233	0,6512	0,5038
A26	0,3286	0,6453	0,3269	0,6097	0,4520	0,5910	0,5100	0,7841	0,6521	0,6087	0,4848
A28	0,2796	0,6187	0,3285	0,5067	0,3348	0,6018	0,3145	0,5572	0,5942	0,7634	0,3007
A29	0,3331	0,6192	0,3151	0,4847	0,3164	0,5215	0,3514	0,5646	0,5436	0,7692	0,3384
A30	0,2828	0,5549	0,336	0,4855	0,3093	0,571	0,338	0,6142	0,6004	0,809	0,2994
A31	0,3149	0,5459	0,3628	0,5387	0,4274	0,5378	0,4302	0,5763	0,5579	0,8129	0,4614
A32	0,3076	0,5653	0,3244	0,5372	0,4373	0,5546	0,4175	0,5716	0,6092	0,8179	0,3845
A33	0,3594	0,6028	0,4176	0,6234	0,5154	0,6451	0,4853	0,6118	0,7886	0,5725	0,4963
A35	0,331	0,5686	0,4038	0,5761	0,3842	0,5819	0,4203	0,6358	0,7953	0,6734	0,4013
A36	0,2275	0,6202	0,2743	0,4923	0,3621	0,5674	0,3465	0,5793	0,7507	0,4856	0,3527
A37	0,3414	0,5666	0,3299	0,4974	0,428	0,4992	0,4325	0,5759	0,7815	0,5002	0,3603
A38	0,2859	0,5133	0,2773	0,5400	0,4216	0,4946	0,4189	0,5932	0,7109	0,5861	0,4300
A39	0,4182	0,5682	0,4404	0,5677	0,4831	0,5822	0,4682	0,6303	0,8198	0,5776	0,4592

Table 46. Cross loadings of alignment indicators of the final measurement model version

Finally, the Table 47 presents the updated AVE values of all first-order constructs of the final version of the model.

	BNF	C&V	CMP	COM	D&C	GOV	P&R	PRT	SKL	TEC	WKL
AVE	0,655	0,676	0,697	0,552	0,741	0,657	0,656	0,670	0,601	0,632	0,651
Composite Reliability	0,850	0,936	0,873	0,880	0,920	0,920	0,905	0,910	0,900	0,896	0,903
Cronbachs Alpha	0,738	0,920	0,780	0,837	0,883	0,895	0,869	0,876	0,867	0,854	0,866

Table 47. AVE values, composite reliabilities and Cronbachs alphas of all first-order constructs of the final measurement model version

As it can be observed, all AVE values are higher than 0.50, and so, it can also be accepted the convergent validity of the model (Hair et al., 2014).

(b) Assessment of the measurement model of the higher-order components

The assessment of the measurement model of the lower-order components resulted in an outer model (measurement model) with fewer indicators than it was initially proposed. Nevertheless, the number of remaining indicators is still very comfortable. The Figure 55 presents a representation of the final version of the inner model (measurement model) versus the outer model (structural model) that containing the first and second order latent variables and their relations.

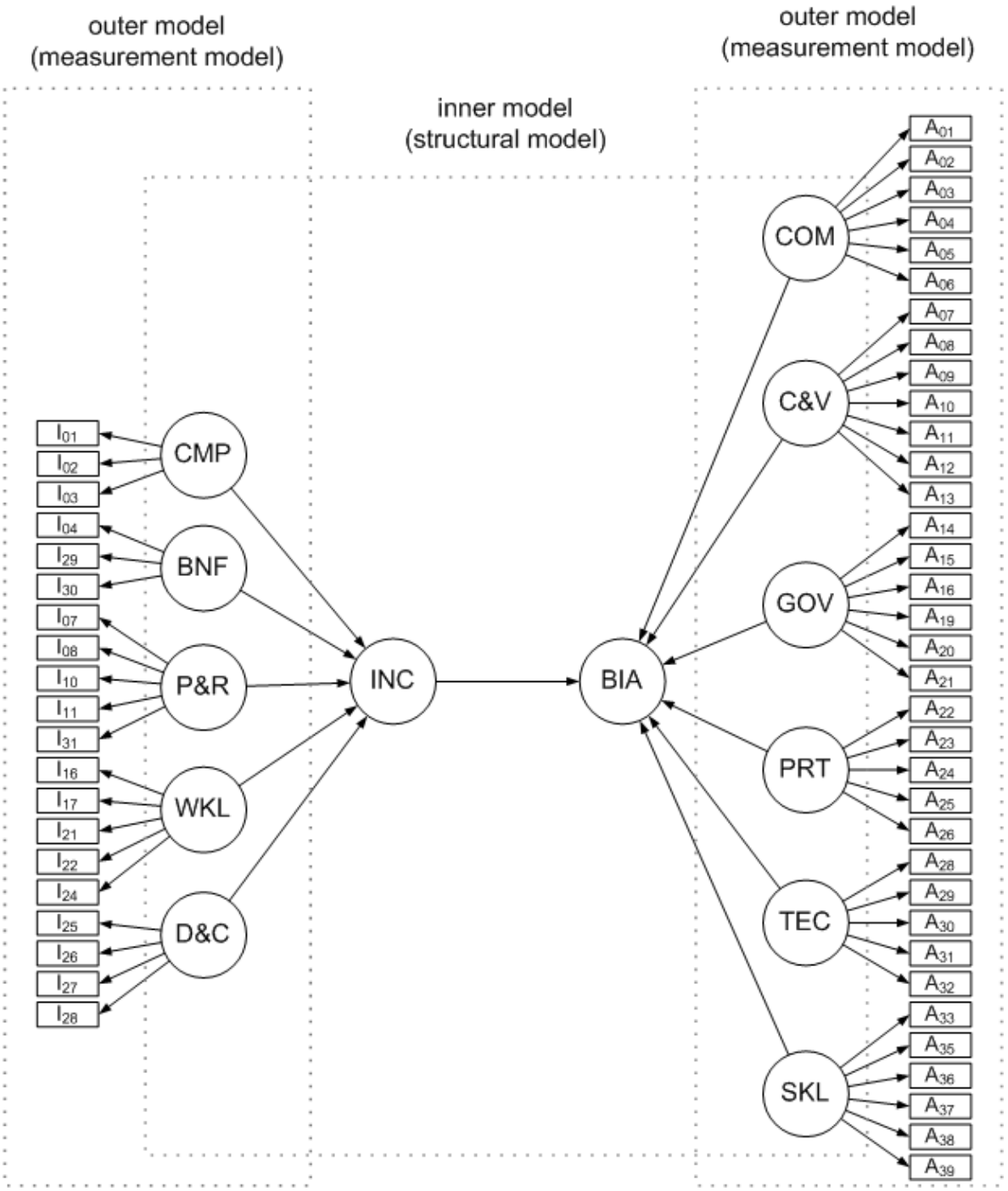


Figure 55: Final inner model (measurement model) versus outer model (structural model)

At the first stage, the HOC's measurement model is established by assigning all the indicators from the LOCs to the HOCs in the form of a repeated indicators method. The second stage consists of operationalizing the structural model by using the latent variables scores of the LOCs (obtained after the previous stage is done) as manifest variables at the HOC measurement model (Hair et al., 2014).

While the LOCs represent a reflective model, the HOCs represent a formative model. Reflective and formative models represent different approaches, and as the formative measures do not necessarily covary, so, the internal consistency underlying reflective measurement model evaluation

cannot be applied the same way to formative models. Consequently, internal consistency reliability is inappropriate and convergent and discriminant validity cannot be analyzed using the same criteria as reflective models. Here, the formative relations were established based on robust content validity procedures of formative constructs (incentive and alignment) that tried to ensure that most important facets of the constructs were considered (Hair et al., 2014).

(b.i) Convergent validity assessment

As, the convergent validity is the extent to which a measure correlates positively with other measures (indicators) of the same construct, then, the coefficient of determination (R^2) of a regression of one explanatory variable on all the other explanators variables of the construct can be used assess the convergent validity.

In judging the degree of convergence between two measures, the proportion of variance that two variables share (R^2) may be used to assess it. According to Cohen (as cited in Bryant et al, 2007), if $R > 0.50$ or $R^2 > 0.25$ then there is a large effect. If $R^2 \approx 0.50$ then the two measures have approximately the same variance in common, so, they are equally convergent than divergent (Bryant, King, & Smart, 2007).

As SmartPLS software does not provide these calculations, it was used another software called Numerical Analysis for Excel (NumXL), an econometrics and time series analysis add-in for Microsoft Excel developed by Spider Financial.

Variable	Tolerance	R^2	VIF	Present?
CMP	54,3%	45,7%	1,84	FALSO
BNF	55,3%	44,7%	1,81	FALSO
P&R	29,6%	70,4%	3,38	FALSO
WKL	27,8%	72,2%	3,60	FALSO
D&C	30,1%	69,9%	3,32	FALSO
Condition Number				4,35

Table 48. Multicollinearity test of first order latent variables of incentive dimension

Variable	Tolerance	R^2	VIF	Present?
COM	34,2%	65,8%	2,92	FALSO
C&V	34,9%	65,1%	2,86	FALSO
GOV	26,4%	73,6%	3,79	FALSO
PRT	24,3%	75,7%	4,12	FALSO
TEC	36,1%	63,9%	2,77	FALSO
SKL	29,8%	70,2%	3,35	FALSO
Condition number				5,20

Table 49. Multicollinearity test of first order latent variables of alignment dimension

The Table 48 and Table 49 present the coefficient of determination (R^2), respectivelly a regression of each first-order variable of incentive and alignment constructs on all the other variables of the same construct. As it can be seen, according to the rule presented before, the convergent validity may be accepted for all first order latent variables.

(b.ii) Collinearity assessment

The assessment of collinearity of lower-order latent variables was also made using the corresponding latent variable scores obtained at the model estimation after the first stage. This assessment was done by applying the tolerance and the variance inflation factor (VIF) values to these scores.

The Table 49 and Table 49 also present the multicollinearity test of all the first order latent variables of incentive and alignment constructs, respectively. Tolerance levels below 0.20 or VIF above 5.00 indicates collinearity (Hair et al., 2014). As it can be observed, there are no variables with tolerance levels below 0.20 or VIF above 5.00 and so, it can be concluded that there is no presence of multicollinearity. However, although they are above the minimum level of tolerance, as some of these constructs have levels close to that reference minimum (almost 20%), that may show that higher-order constructs may make sense.

The Table 49 and Table 49 also present a condition number for each group of latent variables. The condition number (Kappa) test is a standard measure of ill-conditioning in a matrix and when its value is 30 or more, it indicates the presence of multicollinearity. As it can be seen, both groups of variables have a low condition number, confirming that there is no multicollinearity.

(b.iii) Number of indicators and outer weights assessment

At formative models estimation, the outer weights represent the relative effects of the correspondent variables on the construct. Although their weight and significance will be better analyzed forward, when indicators are assumed to be uncorrelated, the maximum advisable outer weight is $1/\sqrt{n}$, where n where n is the number of indicators (Hair et al., 2014).

Consequently, according to this rule, the incentive construct with its 5 dimensions, each one, corresponding to one first order variable, should have a maximum advisable outer weight of $1/\sqrt{5} = 0{,}447$. Similarly, the alignment construct with its 6 dimensions, should have a maximum advisable outer weight of $1/\sqrt{6} = 0{,}408$. As it is presented at Figure 56 further on, that shows the result of the second stage of the model estimation, all weights, except the one which derives from the relation of the COM variable with the BIA, fulfill this rule and so, accordingly, all variables, either coming from the incentive side or the alignment side, are assumed to be uncorrelated. Indeed, there is an excessively high value of the outer weight of the relation of the communications with the alignment. This is probably due to the fact that there are four alignment variables that were not considered statistical significant, and so, that situation would virtually leave almost all the explanation of alignment variance to be made by the communications and skills variables, and expecially, by the communications.

(c) Assessment of the hierarchical structural model

As the previous section confirmed that the measures of the constructs are reliable and valid, so now is possible to assess the structural model. That's what this section aims to address. According to Hair, Hult, Ringle and Sarstedt (2014) the procedure to assess the structural model should comprises the assessment of the significance and the relevance of structural model relations, the accessment of

the level of R2, and the assessment of the predictive relevance of Q2 and the q2 effect sizes. These steps are going to be presented ahead.

(c.i) Structural model path coefficients

The path coefficients of the structured model were estimated by running the PLS-SEM algorithm at SmartPLS software.

Path			$\widehat{\boldsymbol{\beta}}$	t-Value	p-Value
CMP	→	I01	0,744	11,101	0,000
		I02	0,857	28,450	0,000
		I03	0,893	36,021	0,000
BNF	→	I04	0,826	16,153	0,000
		I05	0,734	8,979	0,000
		I29	0,877	30,787	0,000
		I30	0,777	11,670	0,000
P&R	→	I07	0,796	15,925	0,000
		I08	0,830	22,300	0,000
		I10	0,851	19,272	0,000
		I11	0,841	14,080	0,000
		I31	0,789	11,554	0,000
WKL	→	I16	0,831	14,501	0,000
		I17	0,826	14,295	0,000
		I21	0,855	27,879	0,000
		I22	0,745	10,074	0,000
		I24	0,867	29,070	0,000
D&C	→	I25	0,880	31,847	0,000
		I26	0,915	38,645	0,000
		I27	0,789	11,335	0,000
		I28	0,744	11,101	0,000

Table 50. Paths results of structural model regarding the relations between incentive's variables and their indicators after the first stage of the two stage approach

The Table 50 and Table 51 present the path coefficients, the t-values and p-values that were estimated regarding the relations between each variable of incentive and alignment and their indicators. The t-values were obtained after running the bootstrapping procedure.

Path		$\widehat{\boldsymbol{\beta}}$	t-Value	p-Value
COM →	A01	0,684	9,055	0,000
	A02	0,705	8,099	0,000
	A03	0,767	15,228	0,000
	A04	0,774	15,076	0,000
	A05	0,736	12,133	0,000
	A06	0,834	24,071	0,000
C&V →	A07	0,811	18,585	0,000
	A08	0,849	28,080	0,000
	A09	0,851	30,697	0,000
	A10	0,814	20,808	0,000
	A11	0,734	13,853	0,000
	A12	0,839	23,594	0,000
	A13	0,801	18,903	0,000
GOV →	A14	0,825	20,447	0,000
	A15	0,868	28,698	0,000
	A16	0,761	13,781	0,000
	A19	0,771	14,958	0,000
	A20	0,805	19,018	0,000
	A21	0,813	21,785	0,000
PRT →	A22	0,830	17,244	0,000
	A23	0,850	27,521	0,000
	A24	0,770	14,827	0,000
	A25	0,844	27,641	0,000
	A27	0,782	18,213	0,000
TEC →	A28	0,760	15,486	0,000
	A29	0,777	15,635	0,000
	A30	0,805	19,818	0,000
	A31	0,818	19,174	0,000
	A32	0,822	19,689	0,000
SKL →	A33	0,792	20,833	0,000
	A35	0,792	16,639	0,000
	A36	0,749	15,500	0,000
	A37	0,780	16,640	0,000
	A38	0,711	12,337	0,000
	A39	0,818	23,734	0,000

Table 51. Paths results of structural model regarding the relations between alignment's variables and their indicators after the first stage of the two stage approach

All the estimated path coefficients have values close to +1, representing a strong positive relationship. If they were near zero, this would mean that they would be nonsignificant (Hair et al., 2014). As all the path coefficients of each LOC on each indicator (outer loadings) are higher than 0.7, so, it can be confirmed all indicators reliability.

As it was expected at this first stage of the two stage approach, because both HOCs (incentive or alignment) used the same items that were used at the LOCs, the first order variables perfectly explained the variance of the second order variables, and so, the $R^2 \approx 1.0$.

This first stage computed path coefficients relative to links between the observed variables and the LOC variables and also the links between the LOC variables and the HOC variables in the structural equation modeling. Yet, those last relations were not considered at this stage and only will be analyzed after the execution of the second stage's procedure to estimate the hierarchical component model, where the scores of the first order latent variables are used to estimate the final HOCs.

The Figure 56 presents the result of the model estimation using the latent variable scores as manifest variables at HOC measurement model (second stage of the procedure).

As path coefficients represents a standardized version of the linear regression weights in the structural equation modeling approach, the relative effects of first order variables within the fitted regression model part relatively to each second order variable.

The variables development & career (D&C) and performance & recognition (P&R) emerge as the most important variables justifying the incentive, with a path coefficient of 0,373 and 0,249, respectively. The work-life (WKL), with a path coefficient of 0,289, also appears to influence significatively the incentive. Interestingly, compensation (CMP) and benefits (BNF) appear as the less influential dimension of incentive, with path coefficients of 0,119 and 0,044, respectively.

The most important influencer variable of business and IT alignment, with a path coefficient of 0,647, seems to be the communications (COM). It is followed by skills (SKL) and governance (GOV), with path coefficients of 0,282 and 0,156, respectively. The other 3 variables, partnership (PRT), technology scope (TEC) and competency & value measurements (C&V), are less influential dimensions of alignment, with path coefficients of 0,143, -0,029 and -0,136, respectively. Curiously, technology scope (TEC) and competency & value measurements (C&V) seem to have a negative influence on alignment.

(c.ii) Significance and relevance of structural model relations

As the PLS-SEM does not assume that data are normally distributed, the parametric significance tests normally used in regression analyses (CB-SEM) cannot be applied to test the significance of coefficients like outer weights, outer loadings or path coefficients (Hair et al., 2014). The alternative approach is to use the nonparametric bootstrap procedure, already explained above (Hair et al., 2014; Henseler et al., 2009), where a large number of subsamples (bootstrap samples) are drawn from the original sample with replacement. This procedure is also available at SmartPLS software and was applied to test the significance of coefficients.

The Table 51 and Table 52 also present the t values calculations for the first stage of the model estimation. It used SmartPLS bootstrapping procedure with the usage of repeated indicators by LOCs and the correspondent HOCs variables (the indicators used by the HOC variables are hidden in order to simplify the figure). As it can be seen, all path coefficients of the links between the observed variables and the LOC variables may be considered significant at a significance level of 1% ($\alpha = 0.01$; two-tailed test).

As it was already said, at reflective-formative HCM models as this one, it is normal to have almost all of the HOC variance is explained by its LOCs ($R^2 \approx 1.0$), after the first-stage. The effective

explanation among these variables will only be determined after the second stage of these approach, that mixtures the repeated indicator approach and uses of latent variable scores (Hair et al., 2014).

The Table 52 presents the t values calculations after the SmartPLS bootstrapping procedure was applied to 200 bootstrap samples (Hair et al., 2014; Henseler et al., 2009), using the lower-order latent variable scores as manifest variables at the HOC measurement model (second stage model estimation). The t value is obtained using the average $\bar{\beta}$ and the standard deviation $\hat{\sigma}$ of all the path coefficients $\hat{\beta}$ obtained through the estimations made across the many samples produced using the resample technique of bootstrapping. After having the t-values it is possible to calculate the one-tailed p-values, considering $|T|$, the absolute value of T and F(t), the Student's t-distribution function, (Kock, 2015).

$$T = \frac{\bar{\beta}}{\hat{\sigma}}$$

Equation 11: The t-value formula

The Equation 11 and Equation 12 present the t-value and the p-value formulas, respectively.

$$P = \int_{|T|}^{+\infty} F(t)dt$$

Equation 12: The p-value formula

The significance level for each path was assessed through the DIST.T.DIR function of Microsoft Excel software, using the corresponding p-values, considering an one-tailed distribution (Kock, 2015) with 199 degrees of freedom, correspondent to the bootstrap number of samples minus one (Hair et al., 2014).

Path	$\hat{\beta}$	t-Value	p-Value
CMP → INC	0,199	1,197	0,116
BNF → INC	0,044	0,398	0,346
P&R → INC	0,249	1,307	0,096
WKL → INC	0,289	1,386	0,084
D&C → INC	0,373	1,875	0,031
COM → BIA	0,647	4,507	0,000
C&V → BIA	-0,136	0,800	0,212
GOV → BIA	0,156	0,773	0,220
PRT → BIA	0,143	0,684	0,247
TEC → BIA	-0,029	0,178	0,429
SKL → BIA	0,282	1,742	0,042
INC → BIA	0,771	19,340	0,000

Table 52. Paths results of structural model after second stage of the two stage approach

As it can be seen, six paths of this model may be considered significant. The relations of P&R, WKL and D&C with INC may be considered significant, respectively at a significance level of 5%, 5% and 10%. The relations of COM and SKL with BIA may also be considered significant, respectively at a

significance level of 1% and 5%. Finally, and most important, the relation between INC and BIA may be considered significant at a significance level of 1% ($\alpha = 0.01$, $\alpha = 0.05$ and $\alpha = 0.10$ for a significance level of 1%, 5% and 10%, respectively, one-tailed test).

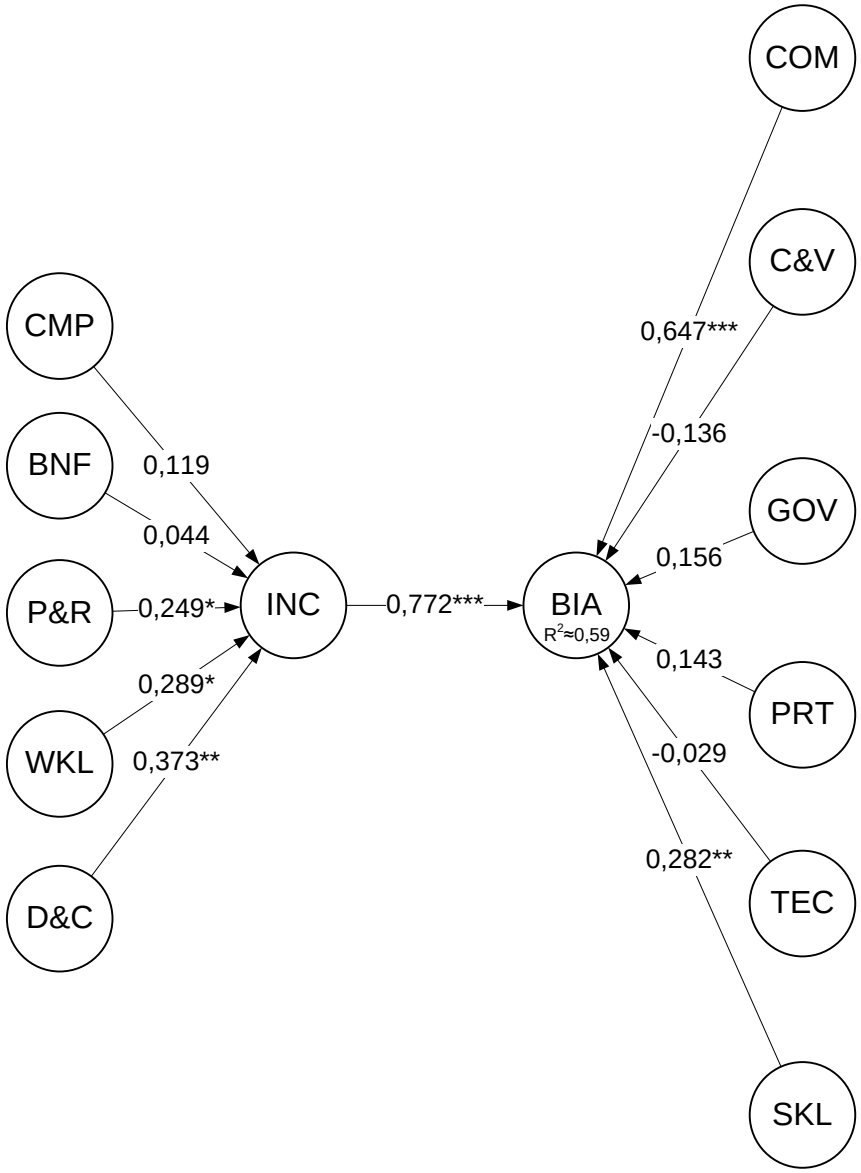


Figure 56: Structured model results after the second stage of the two-stage approach

In accordance, the Figure 56 illustrates the structured model results using the two-stage approach.

(c.iii) Coefficient of determination

The coefficient of determination, usually known as the R^2 value, is the most common measure to evaluate a structural model. It measures the model's predictive accuracy, calculated as the square of the correlation between the predicted values of an endogenous latent variable and its actual values.

At this model, the R^2 value of BIA is 0,59. As the R^2 value vary from 0 to 1, levels closer to 0 shows lower level of predictive accuracy and levels closer to 1 shows higher level of predictive accuracy.

Yet, the more exogenous latent variables a model have, the higher is the R^2 value. So, a better coefficient of determination should consider the number of exogenous latent variables. The adjusted R^2 value, presented at Equation 13, can be used as a criterion to avoid complex models, where n is the sample size and k is the number of exogenous latent variables.

$$R^2_{adj} = 1 - (1 - R^2).\frac{n-1}{n-k-1}$$

Equation 13: The adjusted R^2 formula

The usage of this adjusted coefficient of determination that reduces the R^2 value by the number of the explanatory constructs and the sample size, penalizes models that add nonsignificant exogenous latent variables to explain an endogenous variable, and consequently favors models using a few, but significant, number of exogenous constructs (Hair et al., 2014). These models are called parsimonious models. As this model proposes an explanation of the alignment with just one (higher order) latent variable, its R^2 value is the same as the R^2_{adj}. In fact, this can be considered is a very parsimonious model of the alignment of business and IT.

(c.iv) The blindfolding and predictive relevance

The Q^2 estimation is a value used to access the predictive relevance of the path model. In other words, is a measure of how well the path model can predict the originally observed values. The blindfolding procedure of SmartPLS software was run to make that estimation. After the blindfolding procedure run, the construct crossvalidated redundancy of BIA was estimated. It was used an omission distance of 7, ensuring that the number of observations used in the model estimation, divided by the omission distance (D=7), was not an integer (Hair et al., 2014).

	SSO	SSE	Q^2 (1-SSE/SSO)
BIA	1434,000000	465,6834	0,6815

Table 53. Construct crossvalidated redundancy of BIA

The Table 53 presents the construct crossvalidated redundancy of BIA, where SSO is the sum of the squared observations, SSE is the sum of the squared prediction errors and 1-SSE/SSO, in the last column, is the value of the predictive relevance (Q^2). According to Hair, Hult, Ringle and Sarstedt (2014), if resulting Q^2 value is larger than 0, then the exogenous constructs have predictive relevance for the endogenous construct under consideration. Consequently, it can be concluded that INC latent variable has predictive relevance for the BIA construct. Furthermore, as there is only one exogenous construct to predict BIA at this model, it is pointless to compute relative measures of predictive relevance (q^2) values.

5 RESULTS DISCUSSION

This chapter will discuss the main results of this study that were presented at the previous chapter. First, it will present an interpretation the major results presented at the previous chapter concerning the respondents' characteristics, respectively, by functional area, by gender and by generation. Secondly, it will do the same regarding the characteristics of the companies, respectively, by economic activity and by companies' size. Thirdly, it will present the interpretation concerning the model, namely, about the manifest variables of the incentive, the variables of the alignment and the model itself. Finaly, it will discuss the obtained results taking into consideration the research questions.

5.1 Results concerning respondents

(a) Interpretation of the results by functional area

Although it can be argued that alignment assessment may be different when assessed by respondents from the business or from the IT, the fact is that past researches hadn't reveal that difference (Luftman & Kempaiah, 2007; Silvius, 2007). This study showed that the overall maturity assessment of alignment of the respondents from the IT area for the alignment is 3.32 (see Table 35, page 173), and so, slightly higher value than the maturity assessment made by the IT area respondents, which was 3.28. A sensitive analysis of this overall difference was made using detailed data that underlie to Table 35 and helps us to understand that the maturities differences of the alignment dimensions among the business and IT informants come mainly from the governance and the technology scope, two dimensions where these differences are slightly larger.The governance dimension concerns who has the authority to make IT choices and what processes IT and business managers use at strategic, tactical, and operational levels to set IT priorities to allocate IT resources (Luftman, 2003). At governance dimension, a deeper analysis showed that indicators that support the differences came mainly from A15 or A21 items. The A15 item is relative to the formal IT strategy planning and the A21 item is relative to how projects are prioritized. Both these indicators evaluate some management practices relative to, above all, IT managers. So, a possible explanation about governance perceptions differences may be due to the fact that, in a certain way, managers are assessing their own performance at their jobs, and so, naturally, it is expectable that IT managers may assess these indicators with higher maturities. Likewise, with respect to the technology scope, it is understandable that, as IT managers are also the main responsible for the systems architecture and the entire installed infrastructure, they are also those that value more those alignment indicators. This result is coherent with the study made by Silvius, that revealed an approximately similar assessment of the alignment maturity of those two groups, with also a slightly higher score of the alignment assessed by IT managers comparatively to the opinion of the business managers (Silvius, 2007). Nevertheless, although another study, made by Luftman and Kempaiah, has also revealed roughly identical maturities of those two groups, the assessments had an opposite tendency, with a, though slight, lower alignment score of IT managers comparatively to business managers (Luftman & Kempaiah, 2007).

In what concerns the incentive maturity, as it can also be seen at Table 35 (page 173), it can be observed that the respondents from the business area assessed the incentive with an average of 3.52,

while the IT respondents evaluated it with 3.44, an incentive level slightly lower than from the business side. The slight different perceptions found among the IT and the business managers are mainly supported by the compensation dimension, where IT managers seem to be less pleased with their situation than business managers. A deeper sensitive analysis shows us that the I03 item, concerning the variable payment practice, is the main responsible for this difference. While business managers assess this management practice with 3.00, their peers from the IT side evaluate it with 2.60. So, although there are almost no differences among the business and the IT managers' assessment of incentives, a slight and interesting difference is detected. Despite the base wage is still the stronger indicator from compensation dimension, the difference is mainly justified by the fact of the variable compensation is higher in the compensation package of the business managers than of IT managers.

(b) Interpretation of the results by gender

Regarding possible differences perceptions of different genders, according to the Table 36 (page 174) it seems that no significant differences exist among female and male managers relatively to the global alignment maturity. This seems to be coherent with previous research that also didn't found a significant relation between gender and the alignment (Smith, 2014). Yet, it is interesting to notice that, although different genders appear to have no substantial influence on the alignment maturity, there are subtle differences among them that might deserve to be interpreted. There are two dimensions that slightly differ from each other, with the respective assessments compensating each other and thus, somehow, might camouflaging this general similarity. The assessment of comunications dimension from female managers is 3.27, a lower value than male managers' assessment with 3.38. On the contrary, this difference is partially compensated by another dimension, the competency and value measurements, whose assessment of female managers is 3.27, higher to 3.21 from the male managers and, especially compensated by the skills dimension, which women evaluate with 3.11 and men with 3.04.

As it was said before, men typically have an instrumental communication approach, driving directly to the solutions and problem solving and to establish their hierarchy and supremacy. Also, women traditionally catch the expressive communication style, relying on others speaking about the problems or solving them more collaboratively. They also are usually more sensitive to certain issues than men, looking to build, maintain and strengthen the relationship (Ahmad, 2014; Koch et al., 2005; Mohindra & Azhar, 2012). And, if the mindsets, and the correspondent communication approaches of men and women have these differences, it is understandable that their perception about the maturity of the communication dimension is also different. As organizations are still more formatted with the communication style of men, it might be acceptable that women assess their companies with a lower communication maturity than men. Consequently, the results of this study seem to be in line with a more pessimistic view of women about the communication style at the majority of the companies in Portugal.

Furthermore, as it was said, the maturity assessment of the dimension of competency and value measurements is higher for women than for men. This finding seems to be consistent with the traditional social psychology literature that supports that men are more task-oriented and pragmatics and women are more person-oriented or relationship-oriented (Ahmad, 2014; Minton & Schneider,

1980). Accordingly, by preferring approaches with a more demanding competency and value measuring orientation, men may assess more critically their companies about the maturity of this dimension. Although gender stereotypes seem to be changing over the last decades, especially among male managers which are increasing their perceptions about agentic and task-oriented characteristics of women (Duehr & Bono, 2006), the actual Portuguese society may still essentially be defined as a "masculine society", with its companies largely absorbing that culture, where men are supposed to be assertive, tough, and focused on material success, whereas women are supposed to be more modest, tender, and concerned with the quality of life (Hofstede & Hofstede, 2005; Tarhini, Hone, & Liu, 2014; Terzis & Economides, 2011).

The difference between men and women also happens at the skills dimension. So that this difference could be better understood, a sensitive analysis of this overall difference was made using more detailed data. This analysis helped us to know the business practices that justify the maturities differences at the skills dimension among the female and male informants. Indeed, these differences are mainly justified with the A36 item, which tries to measure the career crossover opportunities. Here, women assessed this practice with 2.88, while men assessed it with 2.44. Apparently, while women think that those opportunities regularly occur at unit management (maturity level 3), men are not so optimistic, assessing it with a lower maturity level, closer with just occasional opportunities (maturity level 2). This result deserves a better investigation in the future so this phenomenon can be confirmed, and if so, the reasons behind it.

Regarding the incentive maturity, this study revealed that male managers seem to be somewhat more motivated than female managers (see Table 36 at page 174). The male informants globally assessed the incentive with 3.51 and the female respondents with 3.41, a value slightly lower. Curiously, the incentive dimensions of compensation and benefits were considered equally mature for female and for male managers.

On one hand, women still have a significant compensation gap comparatively to men. In 2012, the average base compensation for men was 999,85 euros and for women was 814,54 euros, a compensation gap of 18,5% between both. This compensation gap is even higher at senior executive positions, where this gap reaches 27.4%, with an average base compensation of 2.376,55 euros for man and 1.724,90 euros for woman (CCIG, 2014). Yet, on the other hand, the assessment of woman and men about compensation and benefits dimensions seems to evidence that both genders see in a similar way these two dimensions of their incentives. This may be justified by the fact that women may be typically in a lower position in the organization hierarchy and so, it is assumed they would get a lower compensation and benefits package. The differences between women and men occurred on the other three dimensions, especially at performance & recognition dimension at first, and secondly, at development and career opportunities. It seems that women feel worst about the performance and recognition practices at their companies and about the development and the career opportunities they might have. This result is coherent with the idea that men have advantage of typical performance management system, probably due to their greater availability of time and flexibility. And, these two areas may be related. If someone is recognized, he/she will be in a better position to be promoted in the future. Still, this result also seems to be coherent with the idea that men are still getting more career opportunities and promoted than women.

(c) Interpretation of the results by generation

The eventual generational gap is a classical issue in the information systems field. As it was previously explained (page 107), the categories of the respondents' age used at this study questionnaire are based on those most used in IT studies, respectively, the silent generation (born before 1946, i.e., with more than 69 years old), baby boomers (born from 1946 to 1965, i.e., from 50 to 69 years old), generation X (born from 1966 to 1980, i.e., from 35 to 49 years old) and millennials or the generation Y (born after 1981, i.e., with less than 34 years old). The generation Z is still not working, and so, is not considered. The Table 37 (at page 175) clarified that respondents were only distributed by three of the four suggested classes of ages. As it was somehow predictable, since the normal retirement age in Portugal is 66 years old (Centro Nacional de Pensões, 2015), there was no respondents of the silent generation, i.e. with more than 69 years old. Also, the majority of respondents, with more than two thirds of the total number of respondents, belong to the generation X (from 35 to 49 years old) and just about one fifth is baby boomer and one tenth is millennial. This distribution of respondents may be considered biased if we compare it with the total number of inhabitants per generation in Portugal in 2011 (INE, 2011) presented at Table 54.

Generation	Born from	Born until	Number of persons	%
Silent generation and olders	-	1945	1.887.926	18%
Baby boomers	1946	1965	2.770.562	26%
Generation X	1966	1980	2.383.531	23%
Millennials or the generation Y	1981	1999	2.280.990	22%
Generation Z and youngers	2000	-	1.239.169	12%
		Total	10.562.178	100%

Table 54. Distribution of inhabitants per generation in Portugal according to the census 2011

Considering just the three generations that answered the questionnaire, with similar numbers of inhabitants in Portugal, each generation roughly represents about one third of the total population. Yet, the low proportion of respondents of generation Y should be interpreted considering that, on one hand, millennials are arriving to managerial positions, but the great majority of them haven't still reached those positions. On the other hand, today (and not at 2011), baby boomers have between 51 to 70 years old, and so, some of them are also retired. Also, although the boomers are usually seen as committed, hard working and focused on their career, they are also sometimes stereotyped as expensive, difficult to manage, difficult to learn new skills, resistant to change and not being up to date with new technology. These may be reasons to justify a low response rate to online surveys from boomers managers.

Also, it is interesting to note that, as it was already explained before, the larger a company is, the more difficult is to get responses from chief executive officers (CEO), chief information officers (CIO) or other C-Level executives. Yet, this survey still managed to get approximately half of the respondents as top level managers, as it can be seen at Table 34. So, as the percentage of baby boomers respondents is low and the Gen-X so high, this fact may mean that although a significant number of top executives are baby boomers, there are a substantial number of Gen-X managers which already reached a C-Level executive position. If so, the generation X occupies not only the great majority of the current workforce

at companies, but they also represents an important proportion of top executive boards. Finally, X managers were brought up in an era of technological and social change, and they are usually known to be tech-savvy and open to change, which may also be good reasons to justify a higher response rate to this online survey.

Concerning the maturity of the alignment, it is observable that the baby boomers assessed the alignment higher than the generation X or generation Y, respectively with 3.46, 3.25 and 3.24 (Table 37, page 175). This finding seem to be in line with previous research that supported significant positive correlations between age and the IT alignment maturity (Smith, 2014). One possible explanation for this fact is that boomer managers are not as tech-savvy as the X or the Y generations and so could have been less critical in their analysis of the company alignment, and consequently, evaluating it with a higher maturity. Another possible explanation is that governance schemes and main processes were probably defined by baby boomers managers in earlier years of their companies and so, their management practices are best formatted to their point of views and not so to the generation X perspectives. A sensitive analysis clarifies that this difference is particularly noticed at communications dimension and at that dimension, even more detailed, more justified by the A01 item (understanding of business by IT), A02 item (understanding of IT by business), A03 item (organizational learning) and especially by the A06 item (IT–business liaison staff), where the respective differences of the alignment assessment of baby boomers managers and the managers from generation X and Y are greater. Specifically, at item A06, generation X managers assessed this management practice with 3.09, closer to level 3 (facilitate knowledge transfer) while the baby boomers managers assessed this management practice with 3.56, much closer to level 4 (facilitate relationship building). This may be justified by intrinsic differences in communications approaches of both generations, with generation X managers being more direct, preferring to use an informal and pragmatic communication style, to share info immediately and often, to use email as first tool, while baby boomers managers being more diplomatic, preferring to use body language to communicate, to establish a friendly rapport (McCrindle & Wolfinger, 2009; Yu & Miller, 2005).

The Table 37 (at page 175) clarifies that younger generations have lower incentive maturities levels. These differences are larger at compensation and benefits dimensions. So, firstly, these differences of incentive maturities among the different generations seem to be due to the fact that younger generations earn probably less and have poorer benefits than older generations. Yet, some different personality traits, attitudes and lifestyles may also justify the discrepancy of the incentive maturities assessments of informants coming from different generations. The baby boomers are typically enthusiastic and passionate, valuing job status and symbols, organizing their lives around work and not working around life, and are available to work longer and retire later. The generation X is normally reactive and skeptical, working hard, but they do not work without proper reward and at the expense of family, and so, working hard but making sure they have time for family and they have quality of life. The Y-ers are usually assertive and demanding, organizing their work around life and not the life around work, favoring the short term instead the long term and prefer the enjoyment before commitment (McCrindle & Wolfinger, 2009; Yu & Miller, 2005). These different personality traits, attitudes and lifestyles may justify a more critical perspective about incentive of generation Y relative to generation X and the gen X relative to baby boomers, also justifying the found results.

5.2 Results concerning companies

(a) Interpretation of the results by economic activity

The distribution of the surveyed companies by economic activity and their average assessments of incentive and alignment are presented at Table 38 (at page 176). In order to better interpret these results, the Figure 57 shows the global average assessment of the alignment, of the incentive and the number of the surveyed companies, sorted in ascending order of the incentive maturity of the surveyed 14 economic activities. As it can be verified, economic activities with higher incentive levels are typically associated with higher levels of alignment between business and IT. This evidence seems to be coherent with the main hypothesis behind this study which has already been extensively discussed.

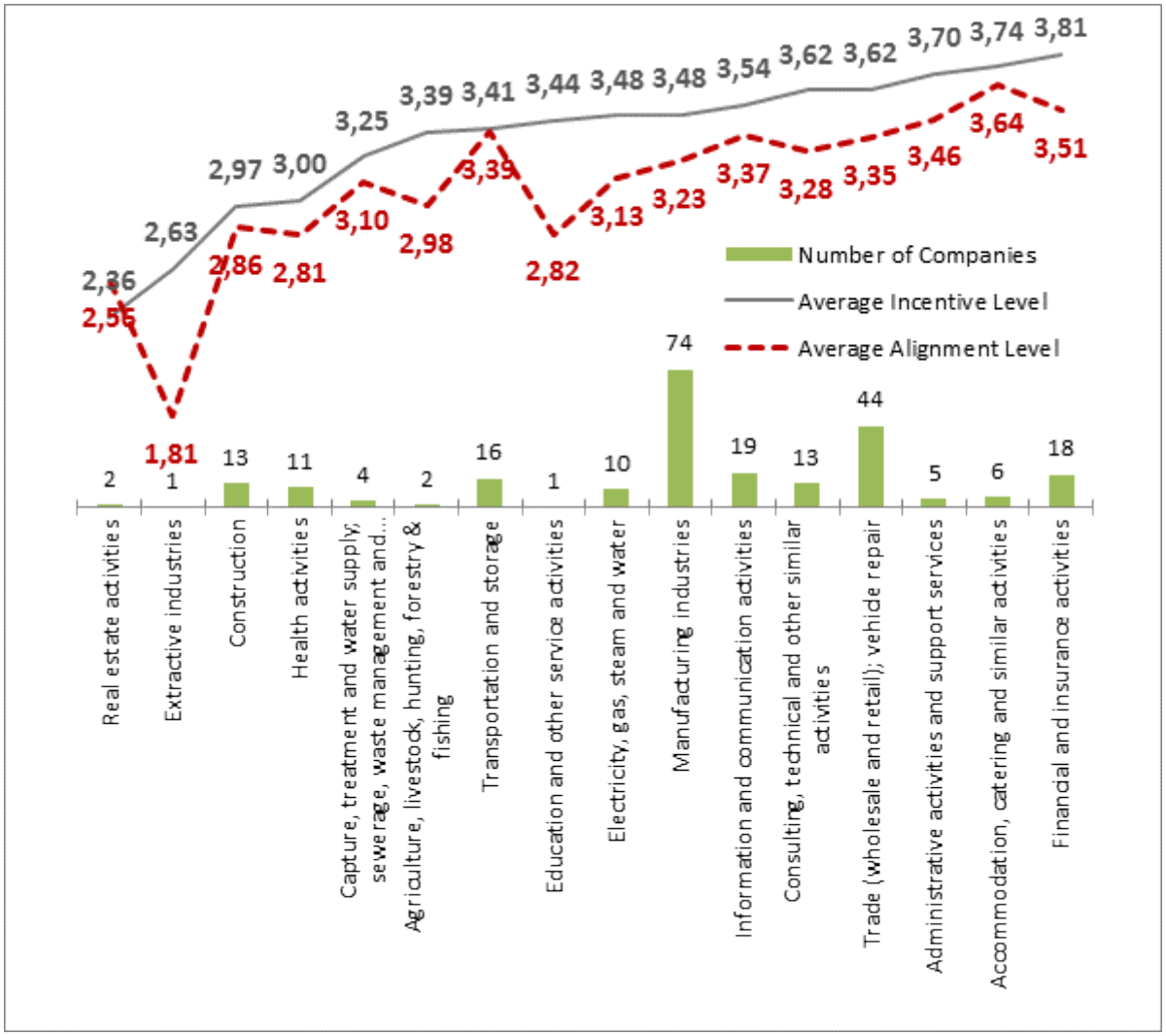


Figure 57: Global assessment of alignment and incentive by companies' economic activity

Another aspect that emerges from these results is the fact that the incentive maturity is typically higher than the alignment maturity. A possible explanation relative to this result may be due to fact that, although misalignment between business and IT is traditionally one of the most important concerns among CIOs (Gartner, 2015; Kappelman et al., 2016; Luftman & Ben-Zvi, 2010b, 2011), it may be not the case of the CEOs of the companies which mostly refer the additional costs to doing

business or the lack of clarity or inconsistency of standards or regulations as as the two most important barriers to respond to changing customer and stakeholder expectations (Snowden & Cheah, 2016). Yet, the attraction, retention and engaging of the employees needed for companies remain relevant and competitive is usually a central concern. According to a recent survey made to 1409 CEO worldwide by PwC, having a skilled, educated and adaptable workforce seems to be a priority for both business or government (Snowden & Cheah, 2016). Another always possible explanation to justify that incentive levels seem to be higher than the alignment is relative to the specific instruments and respective scales used to measure these two constructs. This issue may deserve to be better studied in the future.

The Figure 57 also shows that economic activities (industries) vary significantly in the maturity of their incentive or alignment. As it can be easily observed, the financial and insurance activities is the industry with the higher incentives (3,81). The accommodation, catering and similar activities is the second industry with higher level of incentive (3,74) and the administrative activities and support services occupy the third position in this ranking (3,70). The most aligned industry is the one corresponding to accommodation, catering and similar activities (3,64) and the second most aligned industry corresponds to the financial and insurance activities (3,51). The administrative activities and support services correspond to the third most aligned industry (3.46). Consequently, the industries with higher incentives assessments are also those with higher alignment maturities. Likewise, the three industries with lower incentive are among the more misaligned (four) industries. The industry with lower incentive is the one corresponding to the real estate activities (2,36), the one with the second lowest alignment (2,56). Also, the industry with the second lower incentive maturity (2,63) and the lowest alignment (1,81) corresponds to the extractive industries. However, this result must be interpreted with some caution, since it is supported on a very small number of companies. The industry with the third lower incentive maturity (2,97) and the fourth less aligned assessment (2,86) corresponds to the construction. The third less aligned industry corresponds to the health activities (2.81). In short, there is a huge difference between the industries with the lowest average of incentive maturities and the highest ones. The same happens with the alignment maturities.

By their nature, it would be interesting to try to better understand the maturities' averages at those specific sectors either for the incentive or for the alignment. A study, about inter-industry wage differentials in some European Union countries, presented some interesting results and can help us to clarify some incentives' findings about the industries surveyed at this study (Caju, Kátay, Lamo, Nicolitsas, & Poelhekke, 2010). That study may allow a comparison of the findings of the present research with other countries' realities in what concerns the wage differentials and wage premia of specific sectors of each economy. Of course, as it was previously explained, at the time when the incentive instrument adopted at this study was presented, the remuneration is only one part of the incentive construct and so, considering a single dimension of the incentive construct, as the remuneration, may be considered scarce to make a complete comparison with other countries. Still, on the one hand, other aspects of incentives, which do not correspond to remunerative issues, are generally unavailable. On the other hand, it can also be arguable that, when remunerations are larger, it may mean that the organization is concerned in creating adequate incentives for its employees, not only of remunerative type, but also, of other types. Accordingly, it can be expected that when the remuneration is larger, then the other dimensions of the incentives tend to be better too. Another interesting previous study, addressing the analysis of the alignment maturity levels among different

industries, has also helped to make a comparison about alignment maturities at specific industries. That study, a survey made by Luftman and Kempaiah, analyzing the responses of 197 companies distributed by fourteen industries (Luftman & Kempaiah, 2007), was used to help making an interpretation of the present alignment results. Moreover, as there are not very many studies about alignment maturity among different industries, an international study sponsored by CIONET, the biggest community of IT executives worldwide with over 5500 CIOs, about European key IT and management issues and trends, measuring the IT budget as percent of revenue by industry classification, was also used to lighten some industries' specificities (Luftman & Derksen, 2014).

Looking closer to some of these industries, the findings about the financial and insurance activities show that this industry is very well positioned in terms of the incentive maturity. In fact, this fact is not surprising as this sector is usually among the highest paying industries in most countries (Caju et al., 2010). Likewise, results place this industry at the top in terms of alignment which is coherent with findings from previous studies (Broadbent & Weill, 1993). And, although the Luftman and Kempaiah study did not positioned this sector so well in terms of alignment, with the alignment maturity of the financial industry assessed slightly below the average and the insurance industry evaluated a little above the average (Luftman & Kempaiah, 2007), the CIONET study evidenced that the financial and insurance services was the industry that spent more on IT in 2013 (Luftman & Derksen, 2014), with approximately 10% of the revenue. Furthermore, it is probable that the alignment maturity of the Portuguese financial and insurance companies is higher than at most other countries. There are some examples illustrating the technological innovation of this industry in Portugal, as the MBNET or the Multibanco. The MBNET is an innovative service developed by the Portuguese banking system to perform safely online payments, both domestic and foreign sites. Probably because Portugal was one of the latest countries that adopted the cash machines, also known as automated teller machines (ATMs), and the card-based operations that allowed learning with practices from other countries creating a complete new and innovative ATM network called Multibanco. The Multibanco is an interbank network in Portugal that is owned and is operated by Sociedade Interbancária de Serviços S.A. (SIBS), linking the ATMs of 27 banks in Portugal and totaling 12,700 machines at the end of 2014. With more than 60 different services, like the traditional withdrawal of cash, checking of balances and checking of recent transactions, today, the Multibanco system is known for having more functionality than the standard ATMs in other countries, including other services like mobile phone top-up recharge, show ticket sales and diverse service payment, among others.

The accommodation, catering and similar activities industry is another industry that presents high incentive and alignment. Aparently, this result does not seem to be coherent with the inter-industry wage differentials found in other European Union countries that found the hotels and restaurants activities as one with the lower wage jobs (Caju et al., 2010). Yet, even that the time is still having some economic difficulties in Portugal, the travel and tourism activities (hotels, restaurant and leisure industries, travel agents, airlines and other passenger transportation services) generated 337,000 jobs directly in 2014, corresponding to 7.4% of total employment and it was expected to grow by 4.1% in 2015 to 350,500 corresponding to 7.6% of total employment. It is predictable that these activities will account for 420,000 jobs directly by the year of 2025 in Portugal (WTTC, 2015). Indeed, these activities are some of the few that are strongly increasing their weight and importance in Portugal, attracting new resources and people. If an industry employing more skilled and more

productive workers is expected to offer higher wages (Caju et al., 2010) and considering that the importance of this industry is increasing in Portugal, it is also expectable a current investment on human resources and on other companies resources, like the IT. So, this may be a good explanation for having higher incentive and alignment maturities in Portugal nowadays. The higher alignment maturity of this industry is also coherent with the findings of Luftman and Kempaiah, that assessed the hotel and entertainment industry as the third more aligned sector among the thirteen other sectors (Luftman & Kempaiah, 2007).

Another industry with not only a mature incentive, but also with a mature alignment is the one corresponding to the administrative activities and support services. In Portugal, this sector is composed of very different types of companies. It may comprise so different activities as the selection and placement of staff, travel agencies, tour operators, reservation services, private security activities, cleaning activities, planting and garden maintenance, administrative and supporting services for companies, like call centers, or the activities of reading the gas, water and electricity meters. Such diversity makes more difficult the interpretation of the results. The surveyed companies corresponding to this sector fit at the travel agency/tour operator activity, the distribution of press activity, the equipment rental for construction and events and at the cleaning activity. Relatively to the travel agency/tour operator activity and probably, the cleaning activities, it is admissible that these activities are much correlated with the accommodation, catering and similar activities industry, the other very mature industry. Consequently, the golden era that the tourism sector is living in Portugal may also justify, by contagion effect, a great part of the higher maturities in this industry.

Regarding the industries with lower incentive and alignment maturities, this study pointed out three industries: the real estate activities, the extractive industries and the health activities. The first two industries have a very small number of companies surveyed. Consequently, the risk of having skewed results is high and it is preferable not to make interpretations about these results. The other industry with low maturities corresponds to the health activities. Regarding the incentives, the previously mentioned inter-industry study about wage differentials previously referenced does not address the health activities industry (Caju et al., 2010). In what the alignment concerns, the results also seem to be coherent with other previous studies that assessed the overall average maturities of companies of this industry at the bottom quartil (Evers, 2010). The majority of those companies are specific public hospital center companies, known as E.P.E. (*Entidades Públicas Empresariais*). A low motivational level at hospital centers may be related with the recent crisis in Portugal and the consequent contraction on health care spending. Indeed, according to the OECD, the Portuguese spending on health has severely decreased between 2010 and 2013 in real terms. The health spending per capita in Portugal dropped by 3.7% in 2013 in real terms - the third year in succession that health expenditure has fallen in real terms (OECD, 2015a). On one hand, Portugal seems to been moving to a more efficient hospital system, through significant efforts on the reorganisation of the hospital sector and on the improving the quality of care in recent years, by specialising and concentrating hospital services, adopting new models of hospital management and payment systems, developing quality and safety standards as well as supporting hospital benchmarking. Yet, on the other hand, it is recognized the need to review the incentives system linked to hospital performance and to evaluate the impact of hospital reforms on clinical outcomes and care standards (OECD, 2015b). Indeed, the low incentive's maturity of Portuguese health industry seems to be coherent with the need stressed by the OECD of implementing

appropriate incentives and sanctions, articulated with audits supported on individualised feedback to clinicians and managers. Also, although the health industry is averagely positioned among the fourteen sectors of Luftman and Kempaiah study (Luftman & Kempaiah, 2007), the low level of alignment of this sector seem to be consistent with the fact of this industry having one of the lowest levels of investment on IT, as percent of revenue, among 26 industries (Luftman & Derksen, 2014). The healthcare/medical industry invested 2,23% of the revenues on 2013, even less than the 3,19%, invested on 2012. These values compare with an increasing on the overall average investment, from 4,80% on 2012 to 5,44% on 2013. Regarding the alignment of business with IT, specifically the technological sophistication of the information systems and the degree of the architectural integration, the OECD also underlined that although Portugal has rich data on hospital activities and hospital outcome of care, there is room to improve information linked to the quality of hospital services, developing performance indicators, such as readmission rates, discharge rates, use of day-case surgery or rates of hip surgeries performed within 48 hours (OECD, 2015b). Consequently, the low maturity of the alignment found on health activities in Portugal may be acceptable and justified by the impact of austerity on the economy and on the adjustment of the social model.

(b) Interpretation of the results by size

Furthermore, in general, as it was presented on chapter 4, at Table 41 (page 183), there are no significant differences among companies of different sizes, with respect to global incentive maturities. A closer look to incentive dimensions clarifies that differences of the medium companies with the large companies with more than 5000 employees are almost not visible at the compensation dimension. Nevertheless, these differences are a bit more significant with the other dimensions. So, on one hand, even if the productivity of larger companies in Portugal is significantly higher than at other companies, which is understandable because there are more economies of scale and scope, with an average of 39.6 thousand euros per person employed in large Portuguese companies, comparatively to 17.3 thousand euros of the SMEs (INE, 2013), it seems that this fact is not proportionally reflected on the incentives given to the employees of larger companies. In fact, as it can be seen at Table 11 above (page 109), although the total expense per employee at large companies is significantly higher than the total expense per employee at small and micro companies, the difference is just of 8% higher when compared to the expenses of medium size companies. Furthermore, at large companies, although top managers earn clearly more, the middle managers may earn probably wages similar as their colleagues at smaller companies. So, if most managers of large-sized companies (possibly excluding the chief executives) earn similar wages of the managers of smaller companies, then that may seem coherent with the results of the survey that, did not clearly differentiated the compensation incentives of large companies (especially of those companies with more than 5000 employees) comparatively to the medium sized companies.

On the other hand, at first sight, it seems that incentives are slightly different in what concerns the other types of incentives. If benefits seem to be higher at larger companies, this is compensated by the other types of incentives, respectively, the performance & recognition, the work-life and the development & career opportunities, that seem weaker at larger companies than at medium sized companies. Medium sized companies seem to have better non-material incentives (like those of performance & recognition, work-life and development & career opportunities types) than large

companies. If so, these both findings could be important aspects to be valued and improved when defining an incentive strategy by medium or larger companies in Portugal in the future.

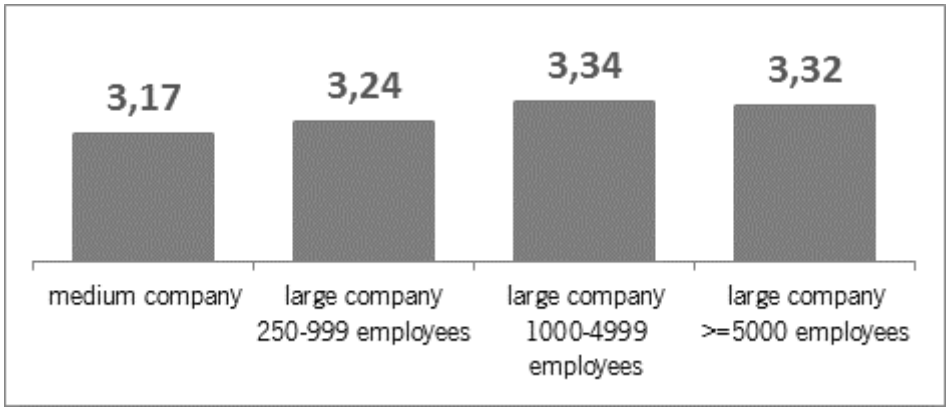


Figure 58: Global assessment of alignment maturity by companies' size

Concerning the maturity of the alignment, it is also observable at Table 41 (page 183) and as it is better resumed at Figure 58, the larger a company is, the more the business is aligned with the IT. This finding seems to be coherent with prior research about the alignment at medium-size and large companies (Chan et al., 2006; Chowa, 2010; Gutierrez et al., 2009), supporting the idea that the larger the organization, the more common is managers introduce formal processes and structures to ensure alignment. The informants of large companies with more than 5000 employees think that their companies have an alignment maturity of 3.32, large companies with more than 999, but less than 5000 employees have an alignment maturity of 3.34, large companies with more than 249, but less than 1000 employees have an alignment maturity of 3.24 and finally, medium size companies have an incentive average maturity of 3.17. Looking to the maturity of each alignment dimension, it is possible to see that the difference between the two most contrasting sides, respectively, the large companies with more than 5000 employees and the medium size companies, is greater at the competency & value measurements, the governance and the partnership dimensions.

The Table 55 supported a sensitive analysis that tried to understand which business practices most influenced major differences between companies at those three different dimensions of alignment. At competency & value measurements dimension, the service level agreements (A10 indicator) and the benchmarking (A11 indicator), are the two indicators that caused a larger difference between medium size companies and large companies with more than 5000 employees. This study revealed that larger companies, especially those with more employees, have clearly more benchmarking practices than medium size companies, a significant fact and that seems to be consistent with previous studies (Pilcher, 1999).

Dimension	Code	Description	medium company	large company 250-999 employees	large company 1000-4999 employees	large company >=5000 employees	% diff.[6]
C&V	A07	IT metrics	2,91	3,07	3,12	3,16	8,7%
C&V	A08	Business metrics	2,90	3,13	3,07	3,04	4,8%
C&V	A09	Link between IT and business metrics	2,99	3,16	3,23	3,13	4,7%
C&V	A10	Service level agreements	2,82	2,94	3,33	3,28	16,4%
C&V	A11	Benchmarking	2,91	3,24	3,24	3,57	22,5%
C&V	A12	Formally assess IT investments	3,14	3,22	3,30	3,32	5,8%
C&V	A13	Continuous improvement practices	3,41	3,56	3,64	3,59	5,4%
GOV	A14	Formal business strategy planning	3,17	3,37	3,35	3,44	8,5%
GOV	A15	Formal IT strategy planning	3,24	3,30	3,33	3,36	3,7%
GOV	A16	Organizational structure	2,80	2,85	3,00	2,88	2,9%
GOV	A17	Reporting relationships	3,53	3,58	3,71	3,85	9,2%
GOV	A18	How IT is budgeted	3,25	3,29	3,53	3,57	9,8%
GOV	A19	Rationale for IT spending	3,45	3,49	3,67	3,51	1,8%
GOV	A20	Senior-level IT steering committee	2,89	2,97	3,17	3,18	10,1%
GOV	A21	How projects are prioritized	3,07	3,35	3,51	3,52	14,6%
PRT	A22	Business perception of IT	3,28	3,48	3,48	3,47	5,6%
PRT	A23	IT's role in strategic business planning	2,97	3,01	3,01	3,09	4,1%
PRT	A24	Shared risks and rewards	3,00	2,94	3,13	3,12	3,9%
PRT	A25	Managing the IT–business relationship	3,35	3,55	3,75	3,77	12,4%
PRT	A26	Relationship/trust style	3,27	3,33	3,37	3,38	3,4%
PRT	A27	Business sponsors/champions	3,28	3,24	3,63	3,40	3,8%

Table 55. Average assessment of alignment indicators of competency & value measurements, governance and partnership dimensions according to companies' dimension

The service level agreement presents a significant number of benefits and is becoming a common practice at a significant number of industries and markets for customers that want to contract a service provider (Karten, 2003). The internal departments of larger companies, like the IT department, also embrace the concept of SLA when dealing with the other departments of their company. Also, the SLAs are becoming especially popular at the domain of the IT , particularly with the rapid growth of the cloud market (Kyriazis, 2013). This study revealed that service level agreements (SLA) seem to be much more expressive at large companies, comparatively to medium sized companies. Although it may be questionable, this seems coherent with the idea that SMEs generally may believe that they are not large enough to benefit from the efficiencies that an SLA and the SLA management may offer. At larger companies, the SLA/SLA management happens on a larger scale and so, its costs may be divided by a large number of service demands and so, it may be worth. Also, another possible reason to medium-sized companies to not employ SLA/SLA management is that some of these companies may have just one IT administrator and that if SLA is implemented, the number of service requests may, suddenly, increase significantly and so, more IT professionals may be needed to answer an increasing demand, with the corresponding increase of the cost of IT.

In respect to the governance dimension, the Table 55 also shows five management practices where the differences between companies with different sizes are significantly higher than at other

[6] This refers to the percentage difference between medium-sized and large companies with more than 5,000 employees.

practices. These practices are relative to the formal business strategy planning (A14 indicator), the reporting relationships (A17 indicator), how IT is budgeted (A18 indicator), the existence of a senior-level IT steering committee (A20 indicator) and how projects are prioritized (A21 indicator). A formal business strategy planning is justified, usually inseparable and may be anchored on senior-level steering committees, where the CIO has the opportunity to provide input to the business planning and then, after some ideas have been discussed, may be operationalized through some project prioritization practices. The existence and the participation of CIOs on executive committees and boards, providing forums for promoting and building consensus for defining information management strategies and solutions is highly recommended (Ali & Green, 2012; ITGI, 2007; McClure, 2000). Results seem to be coherent with the fact that is common that larger companies have a greater tradition in having governance schemes supported on steering committees and more formal planning schemes, where, for instance, an IT steering committee works as a mechanism for supporting information systems planning and management, serving as a high-level executive team, comprised of representatives from various divisions or functions within an organization such as business executives and the CIO (Ali & Green, 2012). Furthermore, governance management practices like sharing the prioritization decisions of IT projects (A21 indicator) is clearly more popular among large companies than at medium-size companies.

As we know, one difference of large companies relative to small and medium-size companies is that large companies generally have more layers of management and more managers in general, than SME businesses. Consequently, as SME have a fewer number of managers than large companies, they usually have a more decentralized and flexible strategic decision-making process. As a company gets larger, it is almost inevitable to centralize and to share its decision-making process and then, the prioritization of projects is a way to reach an agreement and register the level of importance of each project comparatively to the others. The large companies, normally with several business units, adopt a governance model and practices that support an effective portfolio management process that should be conducted by the each business unit driver. It starts with an initial phase to search for investment proposals, followed by the development of adequate feasibility studies and at last, its approval. The project portfolio management process is better done with the prioritization of projects, which are normally numerous at large companies (Van Grembergen & De Haes, 2015). As it was above presented, the fact that large companies are more likely to use senior-level IT steering committees that this study also seems to reveal, favors the discussion among the managers of those companies about the merits of each project and so, the prioritization of projects seems the logic way to manage the portfolio of projects. So, the finding of the study presenting more mature management practices about projects prioritization at larger companies also seems coherent with what should be expected.

Lastly, in respect to the partnership dimension, the Table 46 also shows one management practice that is significantly higher than the other practices. It seems that the way the IT–business relationship is managed (A25 indicator) is expressively more mature at large companies than at medium-size companies. Again, as it was argued above, as large companies seem to favor business strategies planning that include the formal participation of IT managers (A14 indicator), through IT steering committees that include managers, such as business executives coming from different functions and units of the company and the CIOs (A20 indicator), so, these management practices

offer a good opportunity to promote and strengthen the relationship between these managers (A25 indicator), and so, possibly justifying a higher value at this practice at larger companies.

5.3 Results concerning the model

(a) Interpretation of the manifest variables of the incentive

The Table 39 (page 177) presents the descriptive statistics of the manifest variables of the incentive. The averages of incentive maturities assessments can also be graphically viewed at Figure 51 as the SAM overall average line. Among those indicators, there are some that justify a closer analysis, either because their average is too low or too high. Those indicators are commented and some probable interpretations are outlined below.

The I06 item, concerning the retirement benefits, shows an average of approximately 1.9, which is clearly an excessively low value. A sensitive analysis revealed that approximately 60% of the respondents answered as disagreeing strongly (option 1). In fact, this result is not completely surprising. As it was previously presented, some experts previously questioned this item, expressing some doubts about the adaptability of this aspect to the Portuguese reality. As previously stated, all employed persons (workers on behalf of others with a labor contract), members of statutory bodies of legal persons (directors, managers or administrators), self-employed workers (green receipt) have the right to get a retirement pension (Centro Nacional de Pensões, 2015). Actually, unlike countries like the United States of America (USA) or United Kingdom (UK), where popular private schemes, consisting of financial plan arrangements set up by employers, insurance companies, government, or other institutions (OPM, 2014), Portugal is different in terms of retirement benefits. In Portugal, the most important and almost unique regime until some time ago has been the public retirement benefit. So, although some insurance companies had increased their offer in Portugal within these types of insurances, and the adoption of these benefits paid by companies are increasing in Portugal, as it was also formerly said, its acceptance is still not yet widespread, and so, this can justify the low average value of the answers to the I06 item. Furthermore, as it is explained further on, the indicator reliability of I06 item is the lower among the benefits indicators (see Table 42), and so, this item was discarded at the instrument. The rejection of indicator I06 may be due to a significant deviation of this indicator compared to the predicted values for its latent variable (compensation benefits) and so, possibly reflecting the presented arguments. Probably, the same indicator could be considered reliable when used on other different countries.

Another item with somewhat low average assessment, with a value slightly above than 2.4, is the I19 item, concerning financial support to meet family needs, like education ones. A sensitive analysis revealed that approximately 50% of the respondents answered as disagreeing strongly (option 1) or as disagreeing (option 2). Although the financial support given by a company to its employee can include very different types of support like personal financial planning services, a pension plan, a tuition reimbursement (student aid/loan program), a dependent care flexible spending accounts or a health care flexible spending account, a voluntary benefit (e.g., auto, home, pet insurance), a mortgage assistance or a pre-negotiated discount on a variety of products and services (WorldatWork, 2008, 2011) and is relatively popular at the USA and at some other western countries, this seems not to be

the case at the Portuguese reality. Indeed, the low assessment average of respondents to I19 item seems to indicate that these practices are still not common in Portugal. Probably, also reflecting this justification, the indicator reliability of I06 item is also low (see Table 42) among the work-life indicators, and so, this item was also discarded at the instrument. Again, probably, like what might happen with I06 item, the I19 item could also be considered reliable when it is used on other different countries. Another scenario is that undifferentiated managers, like those questioned at this survey, may have lower financial support than C-Level managers, like CEO, CFO, COO, CTO, CIO or other types of chief executives.

Among the highest averages among the incentives indicators, there is the I09 item. This item concerns the job enjoyment. Indeed, it is very significant that this indicator is the one with the higher assessment. First, it seems that Portuguese managers enjoy a lot their job. Second, as it was said before, money is valuable and many people are not strongly motivated by cash incentives, when above a certain level, and, the esteem may work better in order to incentive the enjoyment of someone to do something (Maslow, 1943). Yet, the job enjoyment is also a complex construct and so, the relation may exist not only with its assigned latent variable, the performance and recognition, but with a global construct as the global incentive to work. If so, this may justify the low indicator reliability of the I09 item relative to the performance and recognition construct (see Table 42).

In short, as it was previously shown at Figure 46, there is a clear difference on the average maturity assessment of some incentive dimensions. The dimensions of performance & recognition and the development & career opportunities have clearly higher maturities when they are compared to the dimensions of compensation and benefits. The work-life dimension is on the middle of those four dimensions, somewhat closer to the dimensions that were considered more mature. This phenomenon could be lightened through the lens of Herzberg's motivation-hygiene theory (the two-factor theory) (Herzberg, 1964; Herzberg et al., John Wiley & Sons, Inc./1959). As it was previously presented, this theory categorizes motivation into motivators and hygiene factors and stands that once the hygiene issues are addressed, the motivators promote job satisfaction and encourage production. The factors for satisfaction, or motivators, are factors like achievement, recognition, the work itself, responsibility, advancement or growth and the factors for dissatisfaction, also called hygiene factors, are factors like company policies, supervision, relationship with supervisor and peers, work conditions, salary, status and security. Similarly, on one hand, the incentive dimensions of performance & recognition and the development & career opportunities may be generically considered motivators in the light of Herzberg's motivation-hygiene theory. On the other, the dimensions of compensation and benefits may be considered hygiene factors. The work-life dimension may have characteristics from both sides. Apparently, as it can be seen at Figure 46, it seems there is a clear difference among the incentive maturities of those types of factors that probably might be explained in the light of the Herzberg's motivation-hygiene theory. Further studies can be useful to better understand this phenomenon.

(b) Interpretation of the manifest variables of the alignment

The Table 40 (at page 181) presents the descriptive statistics of the manifest variables of the alignment. As was done with the incentive indicators, the average of alignment maturity assessments can also be graphically viewed at Figure 50 (at page 186) as the SAM overall average line. Similarly,

there are some indicators with a too low or too high average and so, they justify a closer analysis. Those indicators are commented and some probable interpretations are outlined below.

The A36 item, concerning the career crossover opportunities, shows undoubtedly an excessively low value, an average of approximately 2.4. A sensitive analysis about this indicator, previously ilustrated at Figure 48 (page 182), disclosed that approximately 60% of the respondents answered that, at their companies, the "job transfers rarely occur" (maturity level 1) or "occasionally occur within unit" (maturity level 2), with both options with about the same number of answers. Indeed, this seems to be a real problem at the Portuguese companies that, apparently, may partially compromise the desired alignment.

On the other side, the item A04, which is relative to the style and ease of access, appears as the highest assessed indicator, with an average of approximately 3,9, and so, obviously influencing significatively the high maturity of the communication dimension. As we know, there are important differences relatively to the communication style among countries. For example, a comparative study made by Target International Executive Search, GFK and the Central European University revealed significant differences on Central and Eastern European countries (Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovakia) relatively to their management culture. On that survey, when managers are asked if communication with and between managers is not too formal, in some of these countries the responses are pronouncedly distinguished. In Bulgaria and Slovakia such communication is not too formal, according to 77% and 65% of the respondents, respectively. On the opposite side, 50% of the respondents say is formal in Poland and Czech Republic. Also, the hierarchies on those countries tend to be generically formal, with most managers disagreeing when asked if the hierarchies tend to be informal, especially at poland, with as much as 75% of respondents disagreeing with the idea that they are informal (Sányová, Buzady, Bennett, & Brewster, 2015). Indeed, some countries, like the Great Britain, Singapore or the Nordic countries are known for their discreet style of communication. Contrariwise, countries like Portugal, Greece or the Latin American countries, have cultures where communicator styles are more expressive and "where people talk with their hands, where it is socially acceptable to raise one's voice, to show one's emotions, to pound the table". (Guirdham, 2005). Different countries have different cultures, and that implies different communication styles among the companies of those countries. As it can be seen at Table 56, the current survey found a higher maturity of the communication dimension on Portuguese companies, particularly grounded on the style and ease of access, i.e. the style of communication comparatively to other studies in other countries. This finding seems to be partially justified by the Portuguese culture (Guirdham, 2005), probably, more favorable to the development of higher communication maturities on its companies.

In short, the differences among the maturities of alignment dimensions are not as strong as those at the incentive dimensions, as it can be seen at Figure 49. Yet, it still also can be underlined that the skills dimension appears with an average maturity significantly lower than the other dimensions of the alignment. As it can be seen at Table 56, this finding seems to be coherent with other previous studies about alignment that also used the SAM instrument. The work of Evers (2010), that studied the alignment of some hospitals, the work of Luftman (2000) and Chen (2010), that studied the alignment of multiple organizations, also revealed the skills with the lowest maturity among the alignment dimensions (Chen, 2010; Evers, 2010; Lance, 2006; Luftman, 2000; Timothy Ryan,

2010). Hoping to understand the possible reasons for this phenomenon, a sensitivity analysis was done, through a closer look to the manifested variables that are used at the skills dimension. As it was already explained, the lowest indicator average is about the career crossover opportunities (item A36). The second and the third lower indicators are also variables about the skills dimension. One indicator is relative to the cross-functional training and job rotation (item A37), a management practice with a lot in common with the career crossover opportunities (item A36). The other indicator is the attraction and retain of top talent (item A39), where almost half of the respondents answered that job transfers rarely occur (level 1) or that occasionally occur, and only within the unit scope (level 2). These three indicators seem to have a great influence on the low average of the skills dimension.

Findings are also in line with the previous same studies in what refers to the more mature dimension of the alignment. Just like the results presented in this study, the study of Evers (2010), Luftman (2000), Chen (2010) and Lance (2006) also showed that technology scope emerged as the more mature dimension of the alignment. The only exception on these studies was the study of Ryan (2010) where the competency and value measurements appeared as the alignment dimension that was the more mature (Timothy Ryan, 2010).

Management Practice	Luftman 2000	Lance 2006	Ryan 2010	Evers 2010	Chen 2010	Belfo 2016
Industry:	Multiple	Multiple	Airline	Healthcare	Multiple	Multiple
Country:	U.S.A.	Multiple	Multiple	U.S.A.	China	Portugal
communications	2,90	2,63	2,59	2,80	2,85	3,31
comp. & value measurements	3,00	2,72	2,76	2,82	3,24	3,20
governance	3,10	2,73	2,73	2,84	2,45	3,29
partnership	3,00	2,85	2,67	2,80	2,70	3,29
technology scope	3,10	2,88	2,64	2,94	3,00	3,40
skills	2,90	2,60	2,50	2,68	2,35	2,98
global alignment maturity	3,00	2,74	2,65	2,81	2,77	3,25

Table 56. Comparison of assessments averages of alignment dimensions maturities among this and other previous studies

When trying to understand the reasons behind the high level of the technology scope maturity, it is possible to see that this value is anchored on a strong infrastructure transparency (item A31) and a strong infrastructure flexibility (item A32). On both these indicators, almost 60% of the respondents said that the flexibility and transparency degree of the infrastructure is correspondent to effective emerging technology management (level 4) or across the infrastructure (level 5). Finally, standards (item A29) is also strong, with almost 60% of the respondents saying that there is articulation and compliance of IT standards at the enterprise (level 4) or even at the inter-enterprise ambit (level 5).

(c) Interpretation of the results of the proposed model

The previous chapter (at page 190) also presented the assessment results of the proposed model. As can be seen at Figure 55 (page 201), the model was operationalized through a hierarchical component model (HCM) constituted by two types of elements, respectively, higher-order components (HOC) that capture more abstract entities, and lower-order components (LOC), that capture the

subdimensions of the abstract entities. The model method was the PLS-SEM, a prediction-oriented variance-based approach. At PLS-SEM, the evaluation of the measurement and structural model follows a two-step process, where the first step involves a separate assessment of the measurement models and the second step involving the assessment of the structural model (Hair et al., 2014). Relatively to the assessment of the measurement model, the lower-order components of the model (reflective measurement model) were evaluated relatively to its reliability and construct's validity (Wong, 2013), respectively the indicator reliability, the internal consistency reliability, the convergent validity and the discriminant validity. After some indicators have been discarded, according to best practices and most common rules were applied, the reliability and the construct's validities of the measurement model was guarantee.

The assessment of the measurement model of the higher-order components was also done. Yet, as the HOCs represent a formative model, its evaluation was done in a different way than it was done at LOCs, representing a reflective model. Although convergent validity and collinearity assessment have been done, the formative relations were basically established based on robust content validity procedures of formative constructs (incentive and alignment) that tried to ensure that most important facets of the constructs were considered (Hair et al., 2014).

The assessment of the hierarchical structural model, summarized at Figure 56 (page 208), showed that most paths of this model (six) may be considered significant, respectively, the relations of performance & recognition (P&R), work-life (WKL) and development & career opportunities (D&C) with incentive (INC) and the relations of communications (COM) and skills (SKL) with alignment (BIA). There were some relations that could not be considered statistically significant, respectively the relations of compensation (CMP) and benefits (BNF) with incentive (INC), and the relations of competency & value measurements (C&V), governance (GOV), partnership (PRT) and technology scope (TEC) with alignment (BIA). As not all relations are statistically significant, thus, this may call attention for the possible need for improvement of the instrument in the future, for instance, by improving the measurement model, or by changing, creating or eliminating higher-order variables.

Besides examining the significant of the relationships, it is also important assessing the relevance of the relationships that are significant. Indeed, many studies do not address this important step. If the path coeficients are too small, they should not warrant managerial attention (Hair et al., 2014). The statistically significant relationships concerning the incentive are the relating to the development & career opportunities, the worklife and the performance & recognition, with path coefficients of 0,373, of 0,289 and of 0,249, respectively. Consequently, the direct effect of development & career opportunities on incentive is significatively higher than the effect of the others two variables. Concerning the alignment, the statistically significant relationships that preceded it are those relating to the communications and the skills, with path coefficients of 0,647 and 282, respectively. Here, the influence of communications on alignment is remarkably large.

The most important result concerning the model is the relation between the higher order constructs, the incentive and the alignment, that may be considered significant and so, confirming the main objective of this thesis. And still, it should be underlined the magnitude of the variance in the alignment variable that is predictable from the incentive variable (the R^2 value of BIA is 0,59). At a

glance, it should be highlighted that this study shows that significantly more than half of the variance in the alignment is justified by the incentive.

This model is based on the fact that companies offer diverse incentives to their employees, hoping to encourage a specific behaviour and motivating their effort (Incentive, 2009). The incentives that a company proposes are organized under certain principles and rules, usually known as an incentive system (Gallini & Scotchmer, 2002; Porter, 1996; Stolovitch et al., 2002) or reward system (Holmes et al., 2010; Igbaria et al., 1991; Jiang et al., 2009). The incentives and correspondent potential rewards are closely linked concepts, almost inseparable, both representing together an important business management tool. This study proposed an instrument composed by several dimensions to measure the maturity of the incentive system offered by each company. Similarly, it proposed an instrument, also with several dimensions, to measure the maturity of the alignment.

The maturity of the incentive and alignment on each company were evaluated according to the business and IT managers' perspective, those employees that are the most responsible and drivers on seeking a higher alignment between the business and the IT. In fact, the business and IT managers act as agents, supposedly in the best interest of the principal(s), the shareholder(s) of the company that hires the managers. According to the principal–agent problem (theory of agency), the manager (agents) have more information than the shareholder (principal) and there may be moral hazard and conflict of interest between them (Eisenhardt, 1989). In economic agency, the problem is one of selecting an incentive system that will produce behaviour by the agent consistent with the preferences of the principals. The model tested the possible relation between the maturity of the incentive system and the alignment and also, the level of that relation.

The results of the proposed model support the hipothesis that there is a relation between those incentives and the alignment between the business and IT at medium-size and large Portuguese companies. It also supports the hipothesis of having that relation with a positive sign, which means that companies with higher levels of incentive have higher levels of alignment. Finally, the level of influence of the incentives on the alignment is not small, but, on the contrary, it may be considered huge, with the results supporting an important size on that relation (R^2>50%), where the majority of the variation of the alignment is, indeed, explained by the level of incentives among managers. The results of the model assessment seem to be coherent with the expectancy theory proposed by Victor Vroom (1964) which stated that the level of motivation of anyone is dependent on the attractiveness of the rewards and the probability of obtaining those rewards (Jiang et al., 2009). So, depending on the evaluation of the incentives and their associated rewards, the employees tend to put greater or less effort into their work, with the individual and colective level of performance, measured according to organizational objectives like the alignment, appearing as a consequence of that effort. Assuming that managers seek rewards, that are directly or indirectly related with organizational performance, and that managers recognize the alignment of business with IT as one the causes of the organizational performance, then it was expected that there is a direct relation between the incentive level of companies and their level of alignment. That idea was supported by the model results, since companies with higher incentive are generically those with higher alignment.

Also, it seems it is supported not only the idea that "motivation produces" (Richard Ryan & Deci, 2000b), but that there are different types of motivation based on the different reasons or goals that

give rise to an action. The model, by using a large set of indicators behind the dimensions of the incentive construct, supported the idea that an incentive system should comprise an all spectrum of needs, as refered by the Maslow's hierarchy (Maslow, 1943), including basic needs, as physiological, safety, love/belonging, and esteem, and also growth needs.

Moreover, the model results supported the significance of incentive dimensions like performance and recognition, worklife and development and competence (clearly more associated with intrinsic motivations), and have not confirmed the significance of compensation and benefits dimensions of incentives (more related to extrinsic motivations). This may mean that although several dimensions of incentives may be important and cohabit, as stated by the self-determination theory (Richard Ryan & Deci, 2000a), they may represent different types of predictors.

Indeed, the types of incentives that are more linked with the intrinsic motivation seem to be a stronger predictor of alignment. This may be coherent with the theory that intrinsic motivation should be a better predictor of quality of performance, because quality-type tasks, like those associated with the alignment, tend to be characterized by a higher valuation of personal investment and lower external control, as was theorized at the self-determination theory (Cerasoli, Nicklin, & Ford, 2014). Although the incentives associated to extrinsic motivations should also be included, they predict better the quantity-type criteria, usually non-complex, more repetitive and requiring chiefly focus and drive for their completion.

Although more future research is needed, these results may also be coherent with the two-factor theory or the Herzberg's motivation-hygiene theory, that states that there are certain factors in the workplace that cause job satisfaction, while a separate set of factors cause dissatisfaction. This theory states that once the hygiene issues are addressed, the motivators promote the job satisfaction and encourage production (Herzberg, 1964). In fact, the incentives associated to compensation and benefits may be associated with traditional hygiene issues and the incentives associated with indicators linked to dimensions like performance and recognition, worklife and development and competence are more linked with the motivators. So, the motivation-hygiene theory may also justify the differences results of those two sets of incentive dimensions.

5.4 Research questions

This section reviews the research questions formulated at the first chapter and intends to analyse how the findings might have answered those questions.

RQ1: What is the influence of incentives in the alignment of business and IT?

The main research question of this research was expressed as: "What is the influence of incentives in the alignment of business and information technology?" The generic idea behind this question was that there is a direct relation between these two constructs. As it was largely explained, it was expectable that organizations with higher incentives will have a higher alignment between business and information technology. So, this research wanted to primarily confirm that there is a relation of implication between these two constructs and what the dimension of that influence is.

As it was explained, these two constructs are complex and both of them were built based on several dimensions. The model behind that construction that includes the relation between incentive and alignment was represented at Figure 56. As it was previously explained this model was tested and it supports a positive relation between the incentive and the alignment. Moreover, the research also supports the fact that the majority of the explanation of alignment is made by incentive.

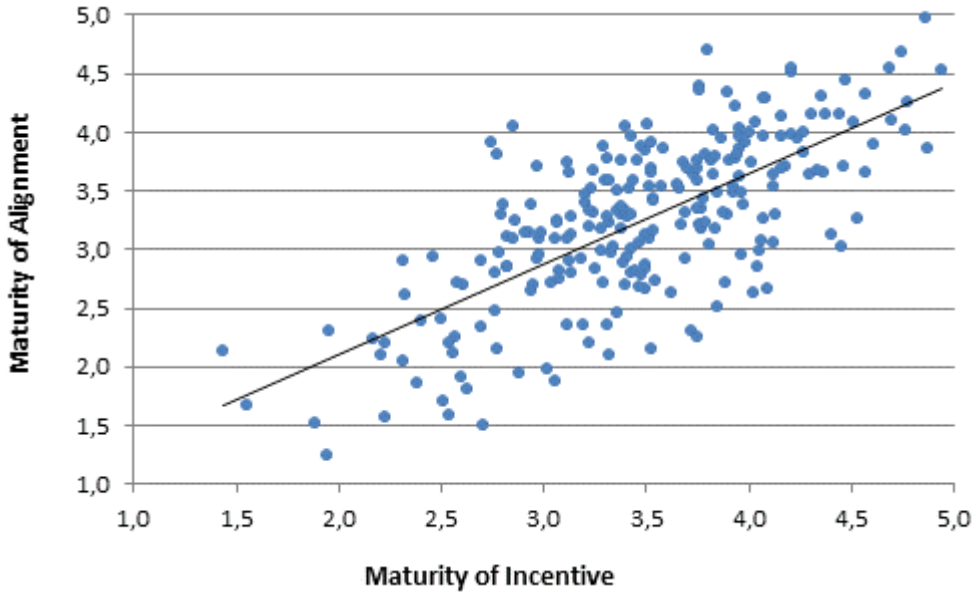


Figure 59: Scatterplot graph with enterprises represented at incentive and alignment axes

Another interesting and simple way to observe the relation between two variables is to draw a scatterplot graph. The Figure 59 presents a scatterplot graph which places on the vertical axis the alignment maturity, as the dependent construct, and on the horizontal axis the incentive maturity, as the independent construct. Each point on the chart represents an enterprise and is characterized by a measurement average of the incentive and the alignment.

This type of graph allows a quick overview and can be good analytical tool. Indeed, this figure shows a large amount of companies and makes it easy to see the correlation between the incentive and the alignment variable. It also allows a better detection of eventual outlier effects. The Figure 59 also shows the positive correlation between the incentive maturity and the alignment maturity among the surveyed enterprises. The line on the figure, representing a linear least squares regression between these two variables, gives a better perception of that positive correlation. The graph clearly reveals that the more incentive an enterprise has, the more aligned it seems to be.

SRQ1: What is the relevance of each dimension of an incentive policy?

The second research question was relative with the relevance of each dimension of an incentive policy. Again, Figure 56 clarifies that three dimensions were considered statistically significant for the incentive construct. The others two did not. As it was said before, the dimensions that were not considered statistically significant may need future improvement of the instrument. The dimensions considered statistically significant were the development & career opportunities, the worklife and the performance & recognition. The ranking of these dimensions according to their influence on the

incentive construct was clearly headed by development & career opportunities with a path coefficient of 0,373, followed by worklife with a path coefficient of 0,289 and by performance & recognition with a path coefficient of 0,249. Although development & career opportunities seems to be very important, the others two dimensions are also important. Curiously, the other two dimensions, compensation and benefits, have not revealed as been significant.

SRQ2:	What is the relevance of each dimension of the alignment of business and IT?

Similarly, the third research question was relative the relevance of each dimension of the alignment. As it can also be seen at Figure 56, two dimensions were considered statistically significant for the alignment construct and four did not. Again, although the used instrument to measure the alignment already has a long road of application in several similar studies, it doesn't mean it may not be improved in the future. The ranking of the importances of each (statistically significant) dimension on the alignment construct was prominently led by the communications dimension with a path coefficient of 0,647. This means that if an excellent communication is assured in a company, this is clearly a good way to ensure an excellent alignment. The second dimension, although significantly farther away from the communications dimension, is the skills, with a path coefficient of 0,282. As it was said, the other dimensions were not considered statistically significant and, and so, their path coefficients should not be valued.

6 CONCLUSION

The current research presents important contributions and implications for research and practice, generically deriving from three articulated topics. Firstly, this research proposes and applies a new instrument to measure the incentive maturity. Secondly, it applies, with some slight adaptations to the Portuguese reality, an existing and partially validated instrument to measure the alignment maturity. Both these instruments were administered, through an online survey platform, to approximately four hundred managers from business and IT, representing more than two hundred medium-size and large Portuguese companies. Finally, this study proposed and tested a complete new model that intends to relate these two complex constructs. This chapter will present the main contributions and implications for research and practice, as well as some of the limitations of this investigation and some recommendations for future research.

6.1 Contributions and implications

(a) Alignment differences of business and IT managers

A first contribution for research is that this study is in line with previous studies (Luftman & Kempaiah, 2007; Silvius, 2007), not reveling very significant differences between the alignment maturity assessment made by respondents from the business area and those from the IT area, but just an assessment slightly higher made by the IT area respondents of the alignment. A deeper analysis helps us to find two dimensions where these differences are slightly larger, precisely the technology scope and, particularly, the governance dimension, where the alignment is considered significatively more mature by IT respondents. Indeed, while the IT respondents considered the governance as the second more mature dimension of the alignment, right after the technology scope, the business participants assessed the governance as the worst dimension. As it was previously argued, a possible explanation about these differences may be probably due to the fact that managers may be assessing their own performance at their jobs, and so, possibly twisting their assessments. On the contrary, the business managers seem to be more critical relative to the IT governance, as this is the lowest mature of alignment dimensions, according to them. The specific difference of the alignment maturity on governance dimension of business and IT managers' perceptions may represent a critic of current IT governance practices by business managers. A possible suggestion to the practice is that companies where this situation is more pronounced is that they should reflect about the possibility of adopting different IT governance practices more in line with the perspective of business managers.

(b) Incentive differences of business and IT managers

Concerning the incentive maturity, another contribution for research is that, as it can be seen at Table 35 (page 173), the respondents from the business area assessed the incentive with a slight higher average than the IT respondents. As it was earlier explained, a bigger difference exists on compensation dimension, anchored on the variable compensation indicator, the one that is considered significantly higher in the compensation package of the business managers comparatively to the one of IT managers. As it was explained before, quality-type tasks, like those needed to search the alignment,

tend to be characterized by a higher valuation of personal investment and lower external control, as was theorized at the self-determination theory (Cerasoli et al., 2014). On the contrary, quantity-type tasks are easier to associate with variable components of compensation. Yet, although not simple, it is recommended that companies should make efforts in order to define improved incentives based on performance-related pay for their IT managers. There are many types of performance-related pay, as the piecework schemes, the individual performance-related pay schemes, the group-related performance-related pay schemes, the knowledge contingent pay, commissions, the profit-related pay or the stock option plans (Nick Ryan, 2013). Of course, it may be easier to pre-define objective targets for certain jobs, like reaching a certain number of customers for the Chief Commercial Officer (CCO) or producing a minimum number of units for the Chief Operating Officer (COO). Yet, although performance of IT managers should not only be based on measurable objectives, the usage of metrics is still important and complementary of the performance evaluation. Some adequate metrics may include the opinion of the internal or external customers about IT services. The SLAs could also be used as inspiration to define specific incentives and rewards for IT managers. Moreover, certain pontual and specific objectives may be sometimes convenient, like the successful launching of a new information system.

(c) Alignment differences of females and males

In what the gender regards, another contribution for research is that there is no significant difference among female and male managers relatively to the global alignment maturity. However, it is interesting to underline that female managers consider less mature the comunications dimension and more mature the competency and value measurements dimension than male managers. A contribution to practice is that companies should adequate the adopted communication styles according to their employees, including the gender and other personal characteristic. Also, as genders differ in the degree of their personal interest about certain dimensions of the alignment, it may be efficient to think on specializations of certain alignment dimensions according to certain personal characteristics, like the gender.

(d) Incentive differences of females and males

Furthermore, regarding the incentive maturity, this study revealed that male managers seem to be somewhat more motivated than female managers (see Table 36 at page 174). This is coherent with the average base compensation statistics of men and woman, especially among senior executive positions (CCIG, 2014). A practical implication relative to this contribution is defining the incentives' plans taking into account the specificities of each one. Besides most female managers still earn less than their male peers, other dimensions should be included in the design of those incentive plans, like development & career opportunities and performance & recognition dimensions that seem to be a bigger concern of female managers beyond compensation issues.

(e) Alignment differences of different generations

This research also addresses one recurrent issue among information systems area of knowledge: the generation gap. The contribution of this study regarding a possible generation gap was that baby boomers considered the alignment higher than the generation X or generation Y (Table 37, page 175). This fact was especially anchored on the communications dimension and at that dimension, even more justified by the understanding of business by IT, the understanding of IT by business, the organizational learning and especially by the IT–business liaison staff, where the respective differences about the alignment assessment of managers from different generations are greater. The proposed explanation for this fact seems to be justified by the intrinsic characteristics of surveyed generations (McCrindle & Wolfinger, 2009; Yu & Miller, 2005), and was that boomer managers are not as tech-savvy as the X or the Y generations, and so, could have been less critical in their analysis of the company. A practical suggestion for companies that are mostly run by boomer managers is to plan some seminars or roundtables about opportunities and challenges of information technologies for business, so that business managers can upgrade their perceptions and knowledge about IT and then, starting to have a more critic, active and participative role on IT issues.

(f) Incentive differences of different generations

Relatively to incentives, this research found that younger generations have lower incentive maturity levels (see page 175). Of course, this may be due to the fact that younger generations earn probably less and have poorer benefits than older generations. Nevertheless, some specific personality traits, attitudes and lifestyles among different generations (McCrindle & Wolfinger, 2009; Yu & Miller, 2005), may also justify the discrepancy of the incentive maturity assessments of the informants coming from different generations. So, a practical suggestion would be the definition of incentive's plans that should take into account the specificities of each one, coming from, not only of the general characteristics of the gender, as it was proposed earlier, but also from the generation of the employee.

(g) Alignment and incentive differences of different industries

Concerning the maturity of the incentive or the alignment by economic activity, this study showed that, coherently with the main hypothesis behind this study, economic activities with higher incentive levels are typically associated with higher levels of alignment between business and IT. Also, as happened on other previous researches (Luftman & Derksen, 2014; Luftman & Kempaiah, 2007), the alignment maturities vary significantly among different industries. The administrative activities and support services and the financial and insurance activities are the industries with the first and second higher incentives, respectively, almost ex aequo (see Figure 57). The accommodation, catering and similar activities is the third industry with higher incentives. The most aligned industry is the one corresponding to financial and insurance activities and the second most aligned industry corresponds to accommodation, catering and similar activities. The administrative activities and support services correspond to the third most aligned industry. Likewise, the three industries with lower incentive are the more misaligned industries. The industries with lower incentives are the real estate activities, extractive industries and the health activities, precisely those sectors with the lowest alignment.

(h) Incentive differences of different campanies' sizes

This research also showed that there are no significant differences among companies of different sizes, with respect to global incentive maturities (see Table 41 at page 183). Yet, another possible contribution is that it seems that incentives like those belonging to performance & recognition, work-life and development & career opportunities types are weaker at larger companies than at medium sized companies, possibly balancing that fact with higher compensations and benefits. Medium sized companies seem to have better non-material incentives (like those of performance & recognition, work-life and development & career opportunities types) than large companies. If so, these both findings could be important aspects to be valued and improved when defining an incentive strategy by larger companies in Portugal in the future.

(i) Alignment differences of different campanies' sizes

Concerning the maturity of the alignment, the larger a company is, the more the business is aligned with the IT (see Table 41 at page 183, or Figure 58). Apparently, the business practices that most influenced the major differences on alignment between companies at the three analysed sizes came from the competency & value measurements dimension, specifically the service level agreements (A10 indicator) and the benchmarking (A11 indicator). These findings were interpreted and seem to be consistent with previous studies either of SLAs (Pilcher, 1999) or benchmarking (Kyriazis, 2013).

(j) Some extreme measures of incentive and alignment

Among the substantial set of indicators used at the survey to measure the incentive maturity, there were some that justified a closer analysis, either because their average were too low or too high (see Table 39 and Figure 51). Two items, the one concerning the retirement benefits and the one concerning financial support to meet family needs, like education, showed a somewhat low average assessment. Among the incentives indicators with the highest averages, there is the one regarding the job enjoyment. Similarly, some indicators coming from the alignment construct were analysed and interpreted. Among those items that stand out because of their excessive values, there is the one concerning the career crossover opportunities, with an extreme low value, while the one relative to the style and ease of access appears as the highest assessed indicator. Some likely interpretations were proposed for each one of these indicators.

(k) Incentive and alignment dimensions are not all significant or equally important

Lastly, the proposed model was operationalized through a hierarchical component model (HCM) constituted by two types of elements, respectively, higher-order components (HOC) that capture more abstract entities, and lower-order components (LOC), that capture the subdimensions of the abstract entities. The model method was the PLS-SEM, a prediction-oriented variance-based approach. The evaluation of the measurement and structural model followed a two-step process, where the first step involves a separate assessment of the measurement models and the second step involving the assessment of the structural model (Hair et al., 2014). Relatively to the assessment of the measurement model, the lower-order components of the model (reflective measurement model) were

evaluated relatively to its reliability and construct's validity (Wong, 2013), respectively the indicator reliability, the internal consistency reliability, the convergent validity and the discriminant validity. After some indicators have been discarded, according to best practices and most common rules were applied, the reliability and the construct's validities of the measurement model was guarantee. As the higher-order components of the model represent a formative model, the assessment of the measurement model was done in a different way than it was done at LOCs. Although convergent validity and collinearity assessment have been done, the formative relations were basically established based on robust content validity procedures of formative constructs (incentive and alignment) that tried to ensure that most important facets of the constructs were considered (Hair et al., 2014).

The assessment of the hierarchical structural model is summarized at Figure 56 (page 208), showing that most paths of this model (six) may be considered significant, respectively, the relations of P&R, WKL and D&C with INC and the relations of COM and SKL with BIA. Regarding the importance of each alignment dimensions, it was also possible to conclude that there are some dimensions more important than others. The communications dimension clearly leads this ranking of importance. The second dimension is the skills, and is also important dimension, but its importance is expressively far behind the communications. So, as it was said earlier, we can conclude that if an excellent communication between the business staff and the IT staff is assured in a company, this is clearly a good way to ensure an excellent alignment between the business and the IT. Curiously, the other dimensions did not contribute significatively to the alignment construct, which is a fact that should make us think in the future about how to better measure the alignment.

(I) Incentive justifies the majority of the alignment

Also, the most important result is the relation between the higher order constructs, INC and BIA, that may be considered significant and so, confirming the main objective of this thesis. More important, it should be underlined the magnitude of the variance in the alignment variable that is predictable from the incentive variable (the R^2 value of BIA is greater than 0.50). At a glance, it should be highlighted that this study shows that the majority (more than half) of the variance in the alignment is justified by the incentive.

The results of the proposed model were based on the perspectives of business and IT managers, precisely those employees that play the role as the most responsible and the greatest drivers on seeking a higher alignment between the business and the IT at their companies, and so, according to the principal–agent problem, or the theory of agency (Eisenhardt, 1989), are those whom is more efficient to motivate to improve the alignment and whose opinion most matters.

The model findings support the hipothesis that at medium-size and large Portuguese companies there is a relation between those incentives and the alignment between the business and IT and also that relation has a positive sign, meaning that companies with higher levels of incentive have higher levels of alignment. Results also support an important size on that relation, meaning that the level of influence of the incentives on the alignment is not small, but on thre contrary, it may be considered huge. These results seem to be coherent with the expectancy theory proposed by Victor Vroom (1964) which stated that the level of motivation of anyone is dependent on the attractiveness of the rewards and the probability of obtaining those rewards (Jiang et al., 2009).

The model used a large set of indicators behind the dimensions of the incentive construct, comprising an all spectrum of possible needs that may be supported by an incentive system, as refered by the Maslow's hierarchy (Maslow, 1943), as basic needs, physiological, safety, love/belonging, and esteem, and also growth needs. The model results supported the significance of incentive dimensions like performance and recognition, worklife and development and competence (clearly more associated with intrinsic motivations), and have not confirmed the significance of compensation and benefits dimensions of incentives (more related to extrinsic motivations). This may mean that although several dimensions of incentives may be important and cohabit, as stated by the self-determination theory (Richard Ryan & Deci, 2000a), they may represent different types of predictors. Indeed, the types of incentives that are more linked with the intrinsic motivation seem to be a stronger predictor of alignment. This may be coherent with the theory that intrinsic motivation should be a better predictor of quality of performance, because quality-type tasks, like those associated with the alignment, tend to be characterized by a higher valuation of personal investment and lower external control, as was theorized at the self-determination theory (Cerasoli et al., 2014). Although the incentives associated to extrinsic motivations should also be included, they predict better the quantity-type criteria, usually non-complex, more repetitive and requiring chiefly focus and drive for their completion. The two-factor theory or the Herzberg's motivation-hygiene theory may also support these results since there are certain factors in the workplace that cause job satisfaction, while a separate set of factors cause dissatisfaction. Once the hygiene issues are addressed (the incentives associated to compensation and benefits), the motivators (indicators linked to dimensions like performance and recognition, worklife and development and competence) promote the job satisfaction and encourage production (Herzberg, 1964). Indeed, some of the differences among the results of the two sets of dimensions of incentives may be justified by the motivation-hygiene theory.

6.2 Limitations

As it was said before, the unit of analysis of this study is the medium or large sized enterprise and the collection of the desired data is based on the perceptions of key informants in the companies of the used sample, a popular practice among empirical MIS researches (Kearns & Lederer, 2003; Segars et al., 1998). Yet, different respondents may imply differences on perceptions about the alignment (and incentive) maturity of one firm. So, the respondents of any survey may, hypothetically, represent always a limitation of it because of a possible existing bias on their answers. This study is not an exception. The research informants appear as the result of a set of circunstances, respectively, their adequacy as company informants, the opportunity of the contact, the availability of the respondents and the possibility of having a personal contact in the desired company, all making easier to get answers. The Table 34 (page 173), the Table 36 (page 174) and the Table 37 (page 175) present the distribution of respondents by level of management and by business-IT area, the distribution of respondents by gender and the distribution of respondents by age, respectively.

Concerning the level of management of the informants, approximately half of the respondents are top level managers, and the other half are other types of managers (see Table 34, at page 173). As it was previously defined, respondents could be middle or top managers. Yet, it is arguable that the best informants about alignment in each firm are, preferably, the CEO or the CIO of a company. So, although people in other positions might be good informants, their opinion should be taken with a

certain care. As it was already mentioned before, regarding the area of the respondents (business or IT), there was a bigger number of business informants than IT informants (see Table 34, at page 173). Indeed, there is no big difference among the maturity assessments of the respondents from the business area or from the IT area (see Table 35, page 173), a result coherent with some other studies about alignment that also support that the alignment assessment made by those two functional groups is not significantly different from each other (Luftman & Kempaiah, 2007; Silvius, 2007). Yet, some caution is needed since, as it was also previously said, that assumption is still not consensual (Byrd et al., 2006; Chan et al., 1997; Chen, 2010; Evers, 2010; Hartung et al., 2000; Luftman et al., 2010; Reich & Benbasat, 2000; Sabherwal & Chan, 2001; Sledgianowski et al., 2008). Other potential distortions about respondents may be related with their gender or their age distribution.

Also, this survey used the Likert method. Although there are significant advantages in using the Likert scaling in surveys, there are also some potential problems with it. One of the best practices very difficult to implement is the one that states that questionnaire designers are urged to ask questions from a neutral standpoint, avoiding to lead the respondents towards a particular response (Johns, 2010). Although each item of the designed instrument has been carefully analyzed before it was used, passing through several phases, according to best strategies of questionnaires validation, this problem is very difficult to be completely overcome.

Another limitation, that is normally associated with the survey method, is that respondents may provide inaccurate and dishonest answers. Although there was the caution of analyzing a possible combined effect of outlier's evidences with other indicators, as a time too short used to answer the inquiry, and consequently a set of responses have been discarded, it cannot be guaranteed that this didn't happen with all the validated answers.

Furthermore, respondents may not have felt comfortable by providing answers that they think may imply placing themselves into an uncomfortable situation. In fact, one of the most sensitive issues in companies is their incentive policy. So, it is understandable that some employees didn't want to answer the survey because they considered this as a private or sigilous matter (as it was argued by some non-respondents and presented before) or that, even answering, have biased their answers because of that reason.

6.3 Recommendations

The alignment of business and IT is a subject that still needs to be worked on, especially in Portugal. As far as we can know, the knowledge concerning the alignment in Portuguese companies is scarce and deserves to be better studied. It is hoped that this research will open doors in the future to other investigations about alignment in Portuguese companies.

As a logical consequence of this research, there are some recommendations for practice that can be proposed. The theme, although it is a general concern among the staff from business and IT, still needs further discussion and deepening by the professional community. The enterprises still need to become more aware of the importance of having their business adequately aligned with their IT. This particular need was especially visible in some industries, precisely those with an alignment maturity very low. This seems to be generically the case of real estate, extractive, construction or health

industries. It would be recommendable the promotion of some initiatives to awareness, like lectures explaining the benefits and opportunities of improving the alignment between business and IT, either with the business strategy as a provider or the IT strategy as a provider of the alignment. These initiatives might open the mind of people to the advantages of alignment and might encourage the organization to plan a strategy to pursue a higher alignment.

Furthermore, if a company decides to define an agenda for alignment, the assessment of its alignment maturity may be used for different objectives, as it was presented and exemplified at section 4.4. It might be used to know where the organization is, concerning the business–IT alignment maturity, and where it needs to go, supporting the identification of the specific actions that are necessary to make this journey. Also, by assessing the alignment maturity at different moments, the company managers may use this instrument to help them to see the progress in the corresponding period. After an agenda for alignment is defined, the progress should be monitored by a predefined committee that is responsible for this specific task, through regular round tables.

The instrument also allows the organization to compare itself with its competitors of the same industry, highlighting weaknesses or strengths and so, helping the definition of a strategy that allows the company to progress and gain a better strategic position in the market.

As it was also exemplified at section 4.4, the same exercise that was done with a particular evaluation of alignment within a company may be done with the incentive instrument in order to evaluate the photograph of the organization relative to its incentive maturity. Also, the incentive instrument may be used to help the company to see possible improvement in certain periods. Finally, if an enterprise has both incentive and alignment maturities assessed, they may have the tools to redefine their incentive policies, having as one of the ultimate goals the improvement of the alignment of business with the IT.

With the instruments proposed in this research to apply to their enterprises, managers may improve strategic alignment between business and IT, by, first, assessing each one of the six alignment dimensions. The possible defined objectives are to seek for more mature communications, for better measures of competence and value, for improved government, for advanced partnerships, for more mature technology or for higher skills adequacy. Secondly, by electing less aligned dimensions, so they can be improved. And third, by defining specific actions that allow the improvement of the maturity of certain alignment dimensions and also by planning, executing, monitoring and evaluating of those actions.

There are also some recommendations for future research that can be proposed. The instrument that was used to measure the maturity of incentive and alignment may be improved. As it was explained before, there are some dimensions of the incentive instrument that were not considered statistically significant. One possibility of future work is to try to use other indicators that could better measure each dimension of incentive. Another possibility, if there is enough theory that supports it, is to change, drop or insert new dimensions.

The same approach may be followed concerning future research to develop an improved instrument to measure the alignment maturity. Although the Luftman's instrument has been widely

used by others authors in the past and for that reason, it represents a good opportunity to compare results within different studies, it doesn't mean this instrument cannot be improved.

Another possibility for future research is to look for another alternative model, with, probably, new different high-level constructs. Although the proposed model supports the fact that the majority of the explanation of alignment is made by the incentive, there is still a part of the alignment phenomenon that is not justified and so, possibly, justifying different new perspectives and models.

Furthermore, this study was focused on medium and large-sized enterprises. It would be interesting to study the phenomenon at small enterprises too. As we know, this type of enterprises, with peculiar characteristics, represents the vast majority of companies, particularly in Portugal. As other studies that were already made in other countries about the alignment at small enterprises, it would be worthy to research that phenomenon in Portugal.

6.4 Final considerations

Today, no one doubts of the crucial role that Information and Communications Technology (ICT) has in the society and organizations, allowing and leveraging the creation of economic opportunities, either through the enhancement of productivity, reducing the transaction and information costs and allowing new models of collaboration or changing the way people work. Yet, the chief executive officers from many of the world's largest companies are strongly concerned with their companies' survival amid an incredible technology-driven disruption and the need of keeping their products and services relevant to their customers, both of which are becoming less and less predictable. In fact, these top-level executives are aware that the new technologies are redefining the value chains and companies need to remain aware to stay relevant. Nowadays, modern businesses need to articulate business needs with innovative information technologies. Ensuring a good interdependence and interrelationship among these two areas is more and more considered vital and is the main objective of aligning the business and the information technology (IT).

The alignment between the business and Information Technology is worthy to be studied, as it remains one of the most important concerns among managers of IT (Gartner, 2015; Kappelman et al., 2016; Luftman & Ben-Zvi, 2010b, 2011). Probably, this concern with the alignment is supported on the conviction that achieving alignment can positively influence business performance (Bergeron et al., 2004; Chan et al., 1997; Chan et al., 2006; Cragg et al., 2002; Croteau & Bergeron, 2001; Denford, 2009; Kearns & Lederer, 2003; Luftman et al., 2010; Palmer & Markus, 2000; Sabherwal & Chan, 2001; Teo & King, 1996). Actually, the Business and IT Alignment (BIA) is considered one of the most important areas of IT governance and its importance is recognized and addressed by some of the most important IT frameworks, like the Control Objectives for Information and related Technology (COBIT), the Information and Technology Infrastructure Library (ITIL) or The Open Group Architecture Framework (TOGAF), each of them with specific proposals to manage it. Although alignment has been the focus of numerous researches in the past, the ongoing concern with the alignment in the last decade also suggests that there was not been sufficient progress in addressing this issue.

Alignment is made by people. And people do not make choices in a vacuum, but in an environment where many issues may influence their decisions. The more people are motivated in

organizations, the more and better they work. The influence that incentives and rewards given to certain professionals have on their behaviour, and therefore, in their professional activity and correspondent productivity have been widely addressed in the literature. Indeed, it is a common practice among companies giving packages of incentives to their executives, desirably designed in order to be aligned with the global organization objectives. This work intended to investigate the influence of incentive policies to promote a better alignment. Besides reviewing the most important literature about alignment, this work also reviewed the most significant literature concerning motivation and incentives.

This study proposes a new model that relates the incentive with the alignment of business and IT. It proposed and applied a new instrument to measure the incentive maturity of an organization and it also applied, with some slight adaptations, an existing and partially validated instrument to measure the alignment maturity. Taking into consideration the best practices concerning surveys, like including a pretesting and a pilot testing phase, both these instruments were administered on a full scale sample, through an online survey platform. Responses from more than four hundred managers from business and IT, representing more than two hundred medium-size and large Portuguese companies, were collected, representing, a very significative survey made about the alignment between business and IT, and, as far as is known, the most important survey ever done in Portugal about this theme.

The strategy adopted to get the sample was, firstly, getting the identification of the companies that composed the sample and their representatives, through the collaboration of a business information company that provided that data. Secondly, the sample of respondents was expanded through a snowball sampling to help on the study of such a hard-to-reach population, using the social network LinkedIn and the interpersonal relationships and connections between people that exist there to increase the number of potential respondents in selected companies. The two main constructs of the proposed model, “incentive” and “alignment”, constructs that may be definitively considered complex, were operationalized through a higher level of abstraction, using a hierarchical component model (HCM). Each one of those two constructs were covered by a set of other constructs (dimensions), which, in turn, were measured at a lower level, with the help of a set of specific indicators. The model was estimated using a structural equation model (SEM) with the partial least squares technique (PLS). The assessment of the measurement model (reflective) was made by an evaluation of its reliability and validity, respectively the indicator reliability, the internal consistency reliability, the convergent validity and the discriminant validity. After some indicators have been discarded, according to best practices and most common rules, the reliability and the construct’s validities of the measurement model were guaranteed. As the higher-order components of the model represent a formative model, the assessment of that measurement model was based on robust content validity procedures of formative constructs (incentive and alignment) guaranteeing, this way, the inclusion of the most important aspects of these constructs.

The major findings are presented, discussed and interpreted by different angles, respectively, by the functional area of respondents, by respondents' gender, by respondents’ generation, by companies’ economic activity, by each one of the manifest variables of incentive and alignment and by companies’ size. Finally, but most important, the results of the proposed model are also discussed and interpreted. Regarding the importance of each alignment dimensions, this study revealed that the

dimensions of incentive and alignment are not all significant or equally important. Definitely, there are some dimensions more important than others. The development & career opportunity is the dimension that most influence the incentive and the communications dimension clearly leads the influence on the alignment. By proposing an explanation of the alignment with just one latent variable as the incentive, this is probably one of the most parsimonious models of the alignment presented until now. Of course the model considers alignment and incentive as higher order variables, each one of them with several dimensions and so, considering many other (first order) variables on it. The great simplicity of the model also allows supporting the one that is perhaps the greatest contribution of this work, which is the fact that the majority of the explanation of the alignment is made by the incentive.

In short, although there are others, the most important contribution of this work is that incentives not only influence the alignment, but also contribute decisively to it. By supporting the hipothesis that alignment is most influenced by the incentives, this finding confirms that enterprises have an opportunity to improve their alignment maturity through the definition of a strategy involving a (re)definition of their incentive policies. This study suggests that a holistic incentive policy should be planned, designed and implemented in order that might be possible to get a more aligned enterprise. The environment that promotes a better alignment should be encouraged by top executives, with the participation of partners if possible, and managed by all levels of the organization down to the individual level. Therefore, if companies really want to better align their business with the IT, they should pay more attention to the definition of their incentive policies, considering the design of packages with balanced benefits, rewards and other multivariate types of incentives to executives from business and IT that also take into account the alignment concerns. This research should also enable researchers in the future to use this work in developing stronger theory about the alignment of business and IT.

REFERENCES

Açoreana. (2012). *Acidentes de Trabalho: Conta de Outrém - Informação Pré-Contratual Condições Gerais e Especiais da Apólice*. Lisboa: Companhia de Seguros Açoreana, SA.

Adams, Carl R., Larson, Eric C., & Xia, Weidong. (2008). *IS-IT Governance Structure and Alignment: An Apparent Paradox*. Minneapolis, USA.

Adams, John, Anderson, Richard, Avery, Gill, Bell, Malcolm, Coombe, Caroline, Dark, Colette, et al. (2012). *Risk Culture: Under the Microscope Guidance for Boards*. London, United Kingdom: The Institute of Risk Management.

Aguinis, Herman, Gottfredson, Ryan K, & Joo, Harry. (2013). Best-practice recommendations for defining, identifying, and handling outliers. *Organizational Research Methods, 16*(2), 270-301. doi: 10.1177/1094428112470848

Ahmad, Kamarul Zaman. (2014). Gender differences and work-related communication in the UAE: A qualitative study. *International Journal of Business and Management, 9*(3), 185.

Albrecht, Chad. (2010). Incentive Insights: The Holy Grail of Incentives: Sales Quota Setting. *Sales & Marketing Management*. Retrieved Sep, 5, 2015, from http://www.salesandmarketing.com/

Alderfer, CP. (1969). An empirical test of a new theory of human needs. *Organizational behavior and human performance, 4*, 142-175.

Alexandrou, Marios. (2010). IT Director Job Description. Retrieved April, 05, 2010, from http://www.mariosalexandrou.com/free-job-descriptions/it-director.asp

Ali, Syaiful, & Green, Peter. (2012). Effective information technology (IT) governance mechanisms: An IT outsourcing perspective. *Information Systems Frontiers, 14*(2), 179-193.

Allen, Tammy D. (2001). Family-supportive work environments: The role of organizational perceptions. *Journal of vocational behavior, 58*(3), 414-435.

Almajali, Dmaithan Abdelkarim, & Dahalin, Zulkhairi Md. (2011a). Applying the Triangulation Approach in IT–Business Strategic Alignment and Sustainable Competitive Advantage. *IBIMA Business Review, 2011*. doi: 10.5171/2011.214481

Almajali, Dmaithan Abdelkarim, & Dahalin, Zulkhairi Md. (2011b). Factors influencing IT-business strategic alignment and sustainable competitive advantage: a structural equation modelling approach. *Communications of IBIMA, 2011*, 1-12.

Almeida, Leandro S, & Freire, Teresa. (2008). *Metodologia da investigação em psicologia e educação* (5ª Edição ed.): Psiquilíbrios Edições.

Aloini, Davide, & Martini, Antonella. (2013). Exploring the exploratory search for innovation: A structural equation modelling test for practices and performance. *International Journal of Technology Management, 61*(1), 23-46. doi: 10.1504/IJTM.2013.050242

Alterman, Toni, Luckhaupt, Sara E, Dahlhamer, James M, Ward, Brian W, & Calvert, Geoffrey M. (2013). Job insecurity, work-family imbalance, and hostile work environment: Prevalence data from the 2010 National Health Interview Survey. *American journal of industrial medicine, 56*(6), 660-669.

Amabile, TM, Hill, KG, Hennessey, BA, & Tighe, EM. (1994). The work preference inventory: Assessing intrinsic and extrinsic motivational orientations. *Journal of Personality and Social Psychology, 94*(S3), 950-967.

Anderson, Carl R, & Paine, Frank T. (1975). Managerial perceptions and strategic behavior. *Academy of Management Journal, 18*(4), 811-823.

Anderson, Robert, Mikuliç, Branislav, Vermeylen, Greet, Lyly-Yrjanainen, Maija, & Zigante, Valentina. (2009). *Second European Quality of Life Survey Overview*. Loughlinstown, Dublin: European Union.

Andrews, Dorine, Nonnecke, Blair, & Preece, Jennifer. (2007). Conducting Research on the Internet: Online Survey Design, Development and Implementation Guidelines. *International Journal of Human-Computer Interaction, 16*(2), 185-210.

Ariely, D, Gneezy, U, Loewenstein, G, & Mazar, N. (2009). Large stakes and big mistakes. *Review of Economic Studies, 76*(2), 451-469.

Arrow, Kenneth J. (1968). The economics of moral hazard: Further comment. *The American Economic Review, 58*(3), 537-539.

Arrow, Kenneth J. (1984). *The Economics of Agency*: DTIC Document.

Asher, Jesal, Briers, Steven, Farrell, John, Homme, Nicole, Hoon, Angela, Malloy, Victoria, et al. (2013). *Expectations of Risk Management Outpacing Capabilities - It´s Times For Action*. In KPMG International Cooperative (Ed.), *Risk Consulting Campaign*. London.

Ashurst, Colin, Doherty, Neil F, & Peppard, Joe. (2008). Improving the impact of IT development projects: the benefits realization capability model. *European Journal of Information Systems, 17*(4), 352-370.

Australian Bureau of Statistics. (2001, November 2001). *Pre-Testing in Survey Development*. Research Paper. Statistical Clearing House Reference Material.

Avila, O., Goepp, V., & Kiefer, F. (2009). Understanding and Classifying Information System Alignment Approaches. *Journal of Computer Information Systems, 50*(1), 2-14.

AXA. (2014). *Seguro AXA Médis: Condições Gerais e Especiais da Apólice*. Lisboa: Médis - Companhia Portuguesa de Seguros de Saúde, S.A.

Bagozzi, Richard P, & Yi, Youjae. (1988). On the evaluation of structural equation models. *Journal of the academy of marketing science, 16*(1), 74-94.

Baicker, Katherine, Cutler, David, & Song, Zirui. (2010). Workplace wellness programs can generate savings. *Health affairs, 29*(2), 304-311.

Baker, George P, & Hall, Brian J. (1998). *CEO incentives and firm size*: National Bureau of Economic Research.

Balhareth, Hamad Hussain, Liu, Kecheng, & Manwani, Sharm. (2012). Achieving Business and IT Alignment from Organisational Learning Perspectives*Proceedings of World Academy of Science, Engineering and Technology*. World Academy of Science, Engineering and Technology.

Baltar, Fabiola, & Brunet, Ignasi. (2012). Social Research 2.0: Virtual Snowball Sampling Method using Facebook. *Internet Research, 22*(1), 57-74.

Banerjee, Tathagata, Banerjee, Arindam, & Paul, Erina. (2011). *A Conceptual Overview of Structural Equation Modeling*: Indian Institute of Management Ahmedabad, Research and Publication Department.

Banker, Rajiv, Feng, Cecilia, & Pavlou, Paul. (2013). *A CIO Compensation Study*. Paper presented at the ANAHEIM 2013. http://aaahq.org/AM2013/display.cfm?Filename=SubID_2765.pdf&MIMEType=application%2Fpdf

Banker, Rajiv, Potter, Gordon, & Srinivasan, Dhinu. (2000). An empirical investigation of an incentive plan that includes nonfinancial performance measures. *The Accounting Review, 75*(1), 65-92.

Barnette, J Jackson. (2000). Effects of stem and Likert response option reversals on survey internal consistency: If you feel the need, there is a better alternative to using those negatively worded stems. *Educational and Psychological Measurement, 60*(3), 361-370.

Barrett, Mary, & Davidson, Marilyn J. (2006). Gender and Communication at Work: An Introduction. In Mary Barrett & Marilyn J Davidson (Eds.), *Gender and Communication at Work*. Aldershot, UK: Ashgate Publishing, Ltd.

Barrick, Murray R, Mount, Michael K, & Strauss, Judy P. (1993). Conscientiousness and performance of sales representatives: Test of the mediating effects of goal setting. *Journal of Applied Psychology, 78*(5), 715.

Baruch, Yehuda. (2004). Transforming careers: from linear to multidirectional career paths: organizational and individual perspectives. *Career development international, 9*(1), 58-73.

Becker, Jan-Michael, Klein, Kristina, & Wetzels, Martin. (2012). Hierarchical latent variable models in PLS-SEM: guidelines for using reflective-formative type models. *Long Range Planning, 45*(5), 359-394.

Belfo, Fernando. (2010). Influence of incentive policy in strategic alignment of information technology and business. In João Eduardo Quintela Varajão, Maria Manuela Cruz-Cunha, Goran D. Putnik & António Trigo (Eds.), *Proceedings of the CENTERIS'2010 - Conference on ENTERprise Information Systems* (pp. 421-430). 109. Viana do Castelo, Portugal: Springler.

Belfo, Fernando. (2011). Development and Career Opportunities of IT Professionals. In Rui Silva & Eduardo Tomé (Eds.), *2nd International Conference on Managing Services in the Knowledge Economy, MSKE* (pp. 225-233). Famalicão, Portugal: Centro Lusíada de Engenharia e Gestão Industrial (CLEGI), Fundação Minerva, Universidade Lusíada.

Belfo, Fernando. (2013). A framework to enhance business and IT alignment through incentive policy. *International Journal of Information Systems in the Service Sector (IJISSS), 5*(2), 1-16. doi: 10.4018/jisss.2013040101

Belfo, Fernando, & Sousa, Rui Dinis. (2011a). Developing an Instrument to Assess Information Technology Staff Motivation. *ENTERprise Information Systems, 220*(3), 230-239.

Belfo, Fernando, & Sousa, Rui Dinis. (2011b). Employee incentives in IT companies: what can we learn from Google? *Proceedings of the IADIS International Conferences, Multi Conference on Computer Science and Information Systems, ICT, Society and Human Beings 2011 & e-Democracy, Equity and Social Justice 2011*, 142-152.

Belfo, Fernando, & Sousa, Rui Dinis. (2011c). A web survey implementation framework: evidence-based design practices*MCIS 2011 - 6th Mediterranean Conference on Information Systems* (pp. Paper 43). Cyprus: Association for Information Systems (AIS).

Belfo, Fernando, & Sousa, Rui Dinis. (2011d). Workforce Incentives at IT companies: the Google's Case. *IADIS International Journal on WWW Internet, 9*(2), 69-84.

Belfo, Fernando, & Sousa, Rui Dinis. (2012). A Critical Review of Luftman´s Instrument for Business-IT Alignment. In António Dias Figueiredo, Isabel Ramos & Eileen Trauth (Eds.), *7th Mediterranean Conference on Information Systems (MCIS2012)*. Paper 78. Guimarães, Portugal: AIS Electronic Library.

Belfo, Fernando, & Sousa, Rui Dinis. (2013). Reviewing Business-IT Alignment Instruments Under SAM Dimensions. *International Journal of Information Communication Technologies and Human Development, 5*(3), 18-40. doi: 10.4018/jicthd.2013070102

Benbya, H., & McKelvey, B. (2006). Using coevolutionary and complexity theories to improve IS alignment: a multi-level approach. *Journal of Information Technology, 21*(4), 284-298. doi: 10.1057/palgrave.jit.2000080

Bentley, Sarah. (2012). *Coaching and Mentoring Research Report*: Asset Skills & United Kingdom Commission for Employment and Skills.

Bergeron, F., Raymond, L., & Rivard, S. (2004). Ideal patterns of strategic alignment and business performance. *Information & Management, 41*(8), 1003-1020.

Bergstresser, Daniel, & Philippon, Thomas. (2006). CEO incentives and earnings management. *Journal of financial economics, 80*(3), 511-529.

Bohannon, John. (2013). Who's afraid of peer review? *Science, 342*(6154), 60-65.

Bollen, Kenneth, & Lennox, Richard. (1991). Conventional wisdom on measurement: A structural equation perspective. *Psychological bulletin, 110*(2), 305.

Bosnjak, M., & Tuten, T.L. (2001). Classifying Response Behaviors in Web based Surveys. *Journal of Computer Mediated Communication, 6*(3), 0-0.

Boudreau, Marie-Claude, Gefen, David, & Straub, Detmar W. (2001). Validation in information systems research: A state-of-the-art assessment. *MIS Quarterly, 25*(1), 1-16.

Bowker, Geoffrey C, Baker, Karen, Millerand, Florence, & Ribes, David. (2010). Toward information infrastructure studies: Ways of knowing in a networked environment. In Jeremy Hunsinger, Lisbeth Klastrup & Matthew M. Allen (Eds.), *International Handbook of Internet Research* (pp. 97-117): Springer Science+Business Media B.V.

Broadbent, Marianne, & Weill, Peter. (1993). Improving business and information strategy alignment: Learning from the banking industry. *IBM systems Journal, 32*(1), 162-179.

Browne, Kaith. (2005). Snowball sampling using Social Networks to Research non-heterosexual Women. *International Journal of Social Research Methodology, 8*(1), 47-60.

Bryant, Fred B, King, Scott P, & Smart, Colette M. (2007). Multivariate Statistical Strategies for Construct Validation in Positive Psychology. In Anthony D. Ong & Manfred H. M. Van Dulmen (Eds.), *Oxford handbook of methods in positive psychology* (pp. 61-82). New York: Oxford University Press.

Burn, Janice M, & Szeto, Colonel. (2000). A comparison of the views of business and IT management on success factors for strategic alignment. *Information & Management, 37*(4), 197-216.

Byrd, Terry Anthony, Lewis, Bruce R, & Bryan, Robert W. (2006). The leveraging influence of strategic alignment on IT investment: an empirical examination. *Information & Management, 43*(3), 308-321.

Caju, Philip Du, Kátay, Gábor, Lamo, Ana, Nicolitsas, Daphne, & Poelhekke, Steven. (2010). *Inter-industry Wage differentials in EU Countries*. Main, Germany: European Central Bank.

Cambridge, University Press. (2010). Cambridge Advanced Learner's Dictionary Online. Retrieved 03/April/2010, from http://dictionary.cambridge.org

Campbell, B. (2007). *Strategic Alignment: A Dynamic Process*. Paper presented at the 18th Australasian Conference on Information.

Capgemini Consulting. (2013). *Shared Services Centers: The Next Generation*. In Philippe Remy, Bertrand Allard, Dominique Bourdeleau, Safia Matouk, Cédric Berthelot, Frédéric Chapuis, Cyril Capello, Yasmina Boukhari & Bastien Seignolles (Eds.). Paris, France: Capgemini Group.

Carpi, Anthony, Egger, Anne, & Kuldell, Natalie. (2009). Peer Review in Scientific Publishing. *Visionlearning, POS-2*(2).

Carpiano, Richard M, & Daley, Dorothy M. (2006). A guide and glossary on postpositivist theory building for population health. *Journal of epidemiology and community health, 60*(7), 564-570.

Carvalho, Ana, & Areal, Nelson. (2015). Great Places to Work®: Resilience in Times of Crisis. *Human Resource Management, 55*(3), 479–498. doi: 10.1002/hrm.21676

Casadesus-Masanell, Ramon, & Spulber, Daniel. (2007). Trust and incentives in agency.

CCIG. (2014). *Rendimento de Género em Portugal 2013*. Lisboa: Comissão para a Cidadania e a Igualdade de Género, Presidência do Conselho de Ministros.

CCS. (2015). LimeSurvey Quick Start Guide: Version 2.2. Retrieved 2015, Nov 01, from https://www.uoguelph.ca/ccs/sites/uoguelph.ca.ccs/files/Quick_Start_Guide_Version_2.2_1.pdf

Centre for Methodology and Informatics, WebSM. (2011). Database of Software Tools for Web-surveys. Ljubljana: Faculty of Social Sciences. Retrieved 2011, 8 January, from http://www.websm.org

Centro Nacional de Pensões. (2015). *Guia Prático – Pensão de Velhice*. Instituto da Segurança Social, I.P.

Cerasoli, Christopher P, Nicklin, Jessica M, & Ford, Michael T. (2014). Intrinsic motivation and extrinsic incentives jointly predict performance: A 40-year meta-analysis. *Psychological Bulletin, 140*(4), 980.

CGD. (2015). Seguro de Desemprego e Baixa Médica. Caixa Geral de Depósitos, S.A. Retrieved April, 10, 2015, from https://www.cgd.pt/particulares/casa/seguros/pages/seguro-desemprego.aspx

Chan, Yolande, Huff, Sid L., Barclay, Donald W., & Copeland, Duncan G. (1997). Business Strategic Orientation, Information Systems Strategic Orientation, and Strategic Alignment. *Information Systems Research, 8*(2), 125-150.

Chan, Yolande, & Reich, Blaize Horner. (2007). IT alignment: what have we learned? *Journal of Information Technology, 22*, 297-315. doi: 10.1057/palgrave.jit.2000109

Chan, Yolande, Sabherwal, Rajiv, & Thatcher, Jason Bennett. (2006). Antecedents and outcomes of strategic IS alignment: An empirical investigation. *IEEE Transactions on Engineering Management, 53*(1), 27-47.

Chelladurai, Packianathan. (2006). *Human resource management in sport and recreation*. Champaign, USA: Human Kinetics.

Chen, Leida. (2010). Business–IT alignment maturity of companies in China. *Information & Management, 47*, 9-16. doi: 10.1016/j.im.2009.09.003

Chin, Wynne W. (1998). Commentary: Issues and opinion on structural equation modeling. *Management Information Systems Quarterly, 22*(1).

Chowa, Charles. (2010). *Strategic Information Systems Alignment: A Longitudinal Investigation.* (Doctor of Philosophy Thesis), University of Missouri, Saint Louis, United States.

Chung, Doug J, Steenburgh, Thomas, & Sudhir, K. (2014). Do bonuses enhance sales productivity? a dynamic structural analysis of bonus-based compensation plans. *Marketing science, 33*(2), 165-187.

CIO Magazine. (2013). *2013 CIO 'State of the CIO' Survey Results*. In CIO Magazine (Ed.): CXO Media.

Cippico, Vinko. (1997). Comparison of the decision support systems and the transaction support system development methodologies. In Rainer Manthey & Viacheslav Wolfengagen (Eds.), *Proceedings of the First East-European Conference on Advances in Databases and Information Systems*. St Petersburg: Springer.

Código do Trabalho. (2012). *Código do Trabalho Atualizado*. Legix - O Seu Braço Direito: Priberam Informática, S.A. Retrieved from http://www.legix.pt/.

Cook, Lewis A. (2011). *Assessing the Relationship of Virtualization, Strategic Alignment, and Information Technology Effectiveness.* (Capella University), Capella University, Minnesota, United States.

Core, John E, Holthausen, Robert W, & Larcker, David F. (1999). Corporate governance, chief executive officer compensation, and firm performance. *Journal of financial economics, 51*(3), 371-406.

Core, John, & Guay, Wayne. (1999). The use of equity grants to manage optimal equity incentive levels. *Journal of accounting and economics, 28*(2), 151-184.

Core, John, Guay, Wayne, & Larcker, David. (2003). Executive equity compensation and incentives: A survey. *Economic policy review, 9*(1).

Couper, MP, & Miller, PV. (2009). Web survey methods: Introduction. *Public Opinion Quarterly, 72*(5), 831.

Cragg, Paul, King, Malcolm, & Hussin, Husnayati. (2002). IT alignment and firm performance in small manufacturing firms. *The Journal of Strategic Information Systems, 11*(2), 109-132.

Cragg, Paul, Mills, Annette, & Suraweera, Theek. (2013). The Influence of IT Management Sophistication and IT Support on IT Success in Small and Medium-Sized Enterprises. *Journal of Small Business Management, 51*(4), 617-636.

Cragg, Paul, Tagliavini, Marco, & Mills, Annette. (2007). Evaluating the alignment of IT with business processes in SMEs.

Creswell, John W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3th ed.). United States of America: Sage publications.

Cronbach, Lee J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297-334.

Cronbach, Lee J., & Meehl, Paul E. (1955). Construct Validity in Psychological Tests. *Psychological Bulletin, 52*, 281-302.

Croteau, A. M., & Bergeron, F. (2001). An information technology trilogy: business strategy, technological deployment and organizational performance. *Journal of Strategic Information Systems, 10*(2), 77-99.

Cumps, Bjorn, Martens, David, De Backer, Manu, Haesen, Raf, Viaene, Stijn, Dedene, Guido, et al. (2009). Inferring comprehensible business/ICT alignment rules. *Information & Management, 46*(2), 116-124.

Cumps, Bjorn, Viaene, Stijn, Dedene, Guido, & Vandenbulcke, Jacques. (2006). An empirical study on business/ICT alignment in European organisations*39th Annual Hawaii International Conference on System Sciences* (pp. 195a-195a). 8. Hawaii: IEEE.

Davidov, Eldad, & De Beuckelaer, Alain. (2010). How harmful are survey translations? A test with Schwartz's human values instrument. *International Journal of Public Opinion Research, 22*(4), 485-510.

DCIPS. (2009). *Guide Writing Effective Performance Objectives, Self Accomplishments, and Evaluations for Employees and Rating Officials*. United States of America Government.

De Haes, Steven, & Van Grembergen, Wim. (2004). IT governance and its mechanisms. *Information Systems Control Journal, 1*, 27-33.

De Haes, Steven, & Van Grembergen, Wim. (2009). An exploratory study into IT governance implementations and its impact on business/IT alignment. *Information Systems Management, 26*(2), 123-137. doi: 10.1080/10580530902794786

Deci, Edward, & Ryan, Richard. (1985a). The general causality orientations scale: Self-determination in personality* 1. *Journal of research in personality, 19*(2), 109-134.

Deci, Edward, & Ryan, Richard. (1985b). *Intrinsic motivation and self-determination in human behavior*. New York, U.S.A.: Plenum Publishing Corporation.

Deci, Edward, & Ryan, Richard. (2009). Self-determination theory: a consideration of human motivational universals. In Philip J. Corr & Gerald Matthews (Eds.), *The Cambridge Handbook of Personality Psychology* (pp. 441-456). New York: Cambridge University Press.

Deci, Edward, & Ryan, Richard. (2011). Self-Determination Theory. Rochester, USA Retrieved 2011, 11 Feb, 2011, from http://www.psych.rochester.edu/SDT/

DeHoratius, Nicole, & Raman, Ananth. (2007). Store manager incentive design and retail performance: An exploratory investigation. *Manufacturing & Service Operations Management, 9*(4), 518-534.

DeLisi, Peter S, & Danielson, Ron. (2007). *A Research Study of IT Alignment*. Santa Clara University. Santa Clara, California, USA.

Denford, James Stephen. (2009). *The Alignment of Knowledge Strategies.* (PhD), Queen's University, Kingston, Ontario, Canada.

DeVon, Holli A, Block, Michelle E, Moyle-Wright, Patricia, Ernst, Diane M, Hayden, Susan J, Lazzara, Deborah J, et al. (2007). A psychometric toolbox for testing validity and reliability. *Journal of Nursing scholarship, 39*(2), 155-164.

Doherty, Charles A. (2010). *Assessment of Public Sector''s Planning and Strategies for Attaining Strategic Alignment.* (Doctor of Philosophy Thesis), Capella University, Ann Arbor, Michigan, USA.

Drost, Ellen A. (2011). Validity and reliability in social science research. *Education Research and Perspectives, 38*(1), 105.

Duehr, Emily E, & Bono, Joyce E. (2006). Men, women, and managers: are stereotypes finally changing? *Personnel Psychology, 59*(4), 815-846.

Dutra, Joel. (2008). Gestão de carreiras. *GVexecutivo, 7*(1), 56-61.

Edmans, Alex, Gabaix, Xavier, & Landier, Augustin. (2009). A multiplicative model of optimal CEO incentives in market equilibrium. *Review of Financial Studies, 22*(12), 4881-4917.

Edwards, Jeffrey R, & Bagozzi, Richard P. (2000). On the nature and direction of relationships between constructs and measures. *Psychological methods, 5*(2), 155.

Eisenhardt, KM. (1989). Agency theory: An assessment and review. *Academy of management review, 14*(1), 57-74.

El-Masri, Mazen, Orozco, Jorge, Tarhini, Ali, & Tarhini, Takwa. (2015). The Impact of IS-Business Alignment Practices on Organizational Choice of IS-Business Alignment Strategies*The 19th Pacific Asia Conference on Information Systems (PACIS 2015)*. Paper 215. Singapore: AIS Electronic Library.

Eriksson, Tor, & Ortega, Jaime. (2006). The Adoption of Job Rotation: Testing the Theories. *Industrial & Labor Relations Review, 59*(4), 651-666.

European Commission. (2015). *User guide to the SME definition*. Luxembourg: Publications Office of the European Union.

European Union. (2003). *Commission Recommendation Concerning the Definition of Micro, Small and Medium-sized Enterprises*. Brussels: European Union.

Eurostat. (1993). Eurostat's Concepts and Definitions Database (CODED). *Official Journal of the European Communities L 076*.

Evans, Nina. (2004). Promoting fusion in the business-IT relationship. *Journal of Issues in Information Science and Information Technology, 1*, 303-311.

Evers, Kevin W. (2010). *Business-IT alignment: A current-state evaluation of strategic alignment within the hospital organization.* (PhD Thesis), Capella University, Ann Arbor, Michigan, USA.

Eys, Mark A, Carron, Albert V, Bray, Steven R, & Brawley, Lawrence R. (2007). Item wording and internal consistency of a measure of cohesion: The Group Environment Questionnaire.

Fahlenbrach, Rüdiger, & Stulz, René M. (2011). Bank CEO incentives and the credit crisis. *Journal of financial economics, 99*(1), 11-26.

Fahy, John. (2000). The resource-based view of the firm: some stumbling-blocks on the road to understanding sustainable competitive advantage. *Journal of European industrial training, 24*(2/3/4), 94-104.

Feeny, David F., Edwards, Brian R., & Simpson, Keppel M. (1992). Understanding the CEO/CIO Relationship. *MIS Quarterly, 16*, 435–448.

Fitzpatrick, Anne R. (1983). The meaning of content validity. *Applied Psychological Measurement, 7*(1), 3-13.

Fortune. (2015). FORTUNE's 100 Best Companies to Work For. Time Inc. Retrieved Apr, 10, 2015, from http://fortune.com/best-companies/

Fox, Christopher, & Zonneveld, Paul. (2006). *IT Control Objectives for Sarbanes-Oxley (SOX)*. Rolling Meadows: IT Governance Institute.

Frey, Thorsten, & Buxmann, Peter. (2011). The importance of governance structures in IT project portfolio management. In Virpi Kristiina Tuunainen, Joe Nandhakumar & Matti Rossi (Eds.), *19th European Conference on Information Systems (ECIS)*. Paper 17. Helsinki, Finland: Association for Information Systems.

Fui-Hoon Nah, Fiona, Lee-Shang Lau, Janet, & Kuang, Jinghua. (2001). Critical factors for successful implementation of enterprise systems. *Business process management journal, 7*(3), 285-296.

Gallini, Nancy, & Scotchmer, Suzanne. (2002). Intellectual Property: when is it the best incentive system? *Innovation Policy and the Economy, Volume 2* (pp. 51-78): MIT Press.

Gartner. (2015). *Building the Digital Platform: Insights From the 2016 Gartner CIO Agenda Report*. Stamford, USA: Gartner.

Gates, Bill. (2016). Bill Gates Quotes. Retrieved 2016, 13 June, from http://www.billgatesmicrosoft.com/

Gerhart, Barry A, Minkoff, Harvey B, & Olsen, Ray N. (1995). Employee compensation: Theory, practice, and evidence. *CAHRS Working Paper Series*, from http://digitalcommons.ilr.cornell.edu/cahrswp/194

Gerow, Jennifer. (2011). *IT-business Strategic Alignment Essays Examining Types of alignment and Their Relationship with Firm Performance.* (Doctor of Philosophy Thesis), Clemson University, Clemson, USA. Retrieved from http://search.proquest.com/docview/919007369

Gesell, Izzy. (2010). How to lead when the generation gap becomes your everyday reality. *The Journal for Quality and Participation, 32*(4), 21.

Google. (2010). Google Jobs. Google Inc. Retrieved November 11, 2010, from http://www.google.com/jobs/lifeatgoogle/toptenreasons/

Gore, Angela K, Matsunaga, Steve, & Eric Yeung, P. (2011). The role of technical expertise in firm governance structure: Evidence from chief financial officer contractual incentives. *Strategic management journal, 32*(7), 771-786.

Grant, Maria J, & Booth, Andrew. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal, 26*(2), 91-108.

Great Places to Work. (2015). What Are the Benefits? Retrieved Apr, 10, 2015, from http://www.greatplacetowork.com/our-approach/what-are-the-benefits-great-workplaces

Grogan, Emma, Geard, Daniel, & Stephens, Elizabeth. (2015). *Performance management: Change is on the way but will it be enough?* : PWC, PriceWaterhouseCoopers Australia.

Group, The Open. (2009). *The Open Group Architecture Framework (TOGAF) - Version 9*: The Open Group.

Grover, V., & Segars, A. H. (2005). An empirical evaluation of stages of strategic information systems planning: patterns of process design and effectiveness. *Information & Management, 42*(5), 761-779. doi: Doi 10.1016/J.Im.2004.08.002

Guba, E, & Lincoln, Y. (1994). Competing paradigms in qualitative research. In NK Denzin & YS Lincoln (Eds.), *The handbook of qualitative research*. Thousand Oaks: Sage Publications.

Guirdham, Maureen. (2005). *Communicating across Cultures at Work*. China: Palgrave Macmillan.

Gunn, H. (2002). Web-based Surveys: Changing the Survey Process. *First Monday, 7*(12).

Gupta, Annapurna, & Tayal, Tarun. (2013). Impact of Competing Force of Motivational Factors on Employees at Work Place*Information and Knowledge Management* (pp. 143-148). 3.

Gutiérrez, Anabel. (2009). *Alignment of IT Projects with Business Strategy: An analysis of the interrelationships between the factors affecting IS alignment at strategic, tactical and operational levels.* (PhD), Brunel University, West London.

Gutierrez, Anabel, Orozco, Jorge, & Serrano, Alan. (2009). Factors affecting IT and business alignment: a comparative study in SMEs and large organisations. *Journal of Enterprise Information Management, 22*(1/2), 197-211. doi: 10.1108/17410390910932830

Gutierrez, Anabel, & Serrano, Alan. (2008). Assessing strategic, tactical and operational alignment factors for SMEs: alignment across the organisation's value chain. *International Journal of Value Chain Management, 2*(1), 33-56.

Hackman, J Richard, & Oldham, Greg R. (1976). Motivation through the design of work: Test of a theory. *Organizational behavior and human performance, 16*(2), 250-279.

Hair, Joseph F, Hult, G Tomas M, Ringle, Christian, & Sarstedt, Marko. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*. United States of America: Sage Publications, Inc.

Hair, Joseph F, Ringle, Christian M, & Sarstedt, Marko. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice, 19*(2), 139-152.

Hair, Joseph F, Ringle, Christian M, & Sarstedt, Marko. (2012). Partial least squares: the better approach to structural equation modeling? *Long Range Planning, 45*(5), 312-319.

Hair, Joseph F, Sarstedt, Marko, Pieper, Torsten M, & Ringle, Christian M. (2012). The use of partial least squares structural equation modeling in strategic management research: a review of past practices and recommendations for future applications. *Long range planning, 45*(5), 320-340.

Hakala, David. (2008). 16 Ways to Measure Employee Performance. *HR World newsletter.* HR World. Retrieved Feb 7, 2015, from http://www.hrworld.com/features/16-ways-measure-performance-021908/

Hambrick, Donald C, & Snow, Charles C. (1977). A Contextual Model of Strategic Decision Making in Organizations*Academy of Management Proceedings* (pp. 109-112). 1977: Academy of Management.

Hanseth, Ole, & Lyytinen, Kalle. (2010). Design theory for dynamic complexity in information infrastructures: the case of building internet. *Journal of Information Technology, 25*(1), 1-19.

Hanseth, Ole, & Monteiro, Eric. (1997). Inscribing behaviour in information infrastructure standards. *Accounting, management and information technologies, 7*(4), 183-211.

Harris, Michael DS, Herron, David, & Iwanicki, Stasia. (2008). *The business value of IT: managing risks, optimizing performance and measuring results*: CRC Press.

Hart, Robert A, & Ma, Yue. (2010). Wage–hours contracts, overtime working and premium pay. *Labour Economics, 17*(1), 170-179.

Harter, S. (1981). A new self-report scale of intrinsic versus extrinsic orientation in the classroom: Motivational and informational components. *Developmental Psychology, 17*(3), 300-312.

Hartman, Jackie L, & McCambridge, Jim. (2011). Optimizing millennials' communication styles. *Business Communication Quarterly, 74*(1), 22-44.

Hartung, S., Reich, Blaize Horner, & Benbasat, Izak. (2000). Information technology alignment in the Canadian Forces. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration, 17*(4), 285-302.

Harvey Nash. (2013). *CIO SURVEY 2013*: Harvey Nash Group plc.

Henderson, John C., & Venkatraman, Natarajan Venkat. (1992). Strategic alignment: A model for organizational transformation through information technology. In T. A. Kocham & M. Useem (Eds.), *Transforming Organizations* (pp. 97-117). New York: Oxford University Press.

Henderson, John C., & Venkatraman, Natarajan Venkat. (1993). Strategic alignment: Leveraging information technology for transforming organizations. *IBM systems journal, 32*(1), 4-16. doi: 10.1147/sj.382.0472

Henderson, John C., & Venkatraman, Natarajan Venkat. (1999). Strategic alignment: leveraging information technology for transforming organizations. *IBM Systems Journal, 38*(2.3), 472-484. doi: 10.1147/SJ.1999.5387096

Henriques, Clara. (2014). Qual a diferença entre seguro de saúde e plano de saúde? : E-konomista.pt. Retrieved Apr, 14, 2015, from http://www.e-konomista.pt/artigo/qual-a-diferenca-entre-seguro-de-saude-e-plano-de-saude/

Henseler, Jörg, Ringle, Christian M, & Sinkovics, Rudolf R. (2009). The use of partial least squares path modeling in international marketing. *Advances in international marketing, 20*(1), 277-319.

Herzberg, Frederick. (1964). The Motivation-Hygiene Concept and Problems of Manpower. *Personnel Administrator*(27), 3–7.

Herzberg, Frederick, Mausner, Bernard, & Snyderman, Barbara Bloch. (1959). *The Motivation to Work*. New Jersey: Transaction Publishers, New Brunswick. (Original work published John Wiley & Sons, Inc.).

Hinkin, Timothy R. (1998). A brief tutorial on the development of measures for use in survey questionnaires. *Organizational research methods, 1*(1), 104-121.

Hofstede, Geert, & Hofstede, Gert Jan. (2005). *Cultures and Organizations: Software of the Mind*. New York: McGraw-Hill.

Holmes, Nathaniel, Carvalho, Geraldo, & Powers, Marie. (2010). *Reward Systems & Incentives*. Human Resources & Labor Management.

Hoque, Faisal. (2002). *The Alignment Effect: How to Get Real Business Value Out of Technology*. New Jersey, United States of America: Finantial Times Prentice Hall.

House, Robert J, & Wigdor, Lawrence A. (1967). Herzberg's dual-factor theory of job satisfaction and motivation: A review of the evidence and a criticism. *Personnel psychology, 20*(4), 369-390.

HR-Survey, LLC. (2011). Employee Attitude Survey. Pittsburgh Retrieved 2011, March 25, from http://www.hr-survey.com/

Hsu, MK, Jiang, JJ, Klein, G, & Tang, Z. (2003). Perceived career incentives and intent to leave. *Information & Management, 40*(5), 361-369. doi: 10.1016/S0378-7206(02)00018-6

Huang, C Derrick, & Hu, Qing. (2007). Achieving IT-business strategic alignment via enterprise-wide implementation of balanced scorecards. *Information Systems Management, 24*(2), 173-184. doi: 10.1080/10580530701239314

Huang, Sun-Jen, Wu, Ming-Shian, & Chen, Li-Wei. (2013). Critical success factors in aligning IT and business objectives: A Delphi study. *Total Quality Management & Business Excellence, 24*(9-10), 1219-1240.

Hulland, John, & Business, Richard Ivey School of. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic management journal, 20*(2), 195-204.

Hussin, Husnayati, King, Malcolm, & Cragg, Paul. (2002). IT alignment in small firms. *European Journal of Information Systems, 11*(2), 108-127.

Iacobucci, Dawn. (2010). Structural equations modeling: Fit indices, sample size, and advanced topics. *Journal of Consumer Psychology, 20*(1), 90-98.

Idealist Careers. (2015). Common Job Benefits. *Idealist Careers.* Idealist. Retrieved April, 4, 2015, from http://idealistcareers.org/common-job-benefits/

IFI, Incentive Federation Inc. (2010). Incentive Legislation Campaign. Retrieved 2013, Dec 26, from http://incentivefederation.org/associations/12350/files/FAQs_final_11-8-10.pdf

Igbaria, Magid, Greenhaus, Jeffrey H., & Parasuraman, Saroj. (1991). Career orientations of MIS employees: an empirical analysis. *MIS quarterly, 15*(2), 151-169.

Ihator, Augustine S. (2001). Communication style in the information age. *Corporate Communications: An International Journal, 6*(4), 199-204.

Incentive. (2009). Available from The American Heritage Dictionary The American Heritage Dictionary of the English Language Retrieved 2013, May 30, from http://www.thefreedictionary.com/incentive

Indjejikian, Raffi J. (1999). Performance Evaluation and Compensation Research: An Agency Perspective. *Accounting Horizons, 13*(2), 147-157.

INE. (2007). *Classificação Portuguesa das Actividades Económicas Rev.3*. Lisboa: Instituto Nacional de Estatística, I.P.

INE. (2011). População residente, segundo a dimensão dos lugares, população isolada, embarcada, corpo diplomático e sexo, por idade (ano a ano). Retrieved 2016,Apr 01, from Instituto Nacional de Estatística http://www.ine.pt/investigadores/Quadros/Q601.zip

INE. (2013). *Empresas em Portugal 2011*. Lisboa: Instituto Nacional de Estatística, I.P.

INE. (2014). *Empresas em Portugal 2012*. Lisboa: Instituto Nacional de Estatística, I.P.

Informa. (2015). A empresa. Retrieved 2015, Dec 08, from https://www.informadb.pt/idbweb/public/QSEmpresa.xhtml

Intelispend. (2012). *Ten Employee Incentive Essentials: A survival guide for employee rewards and recognition planners*: Intelispend.

Intelispend. (2013). Exploring Employee Incentives: Useful facts, figures, and inspiration for rewards & recognition. Intelispend. Retrieved 2013, Dez 23, 2013, from http://intelispend.com/employee-rewards-recognition/

Isaac, RG, Zerbe, WJ, & Pitt, DC. (2001). Leadership and motivation: The effective application of expectancy theory. *Journal of Managerial Issues, 13*(2), 212-226.

ISO. (2010). *International Standards and "Private Standards"*. Geneva, Switzerland: International Organization for Standardization.

ISO. (2015). Standards. International Organization for Standardization. Retrieved 2015, Oct 26, 2015, from http://www.iso.org/iso/home/standards.htm

ITGI, IT Governance Institute. (2007). *Control Objectives for Information and related Technology (COBIT 4.1)* (4th ed.). Rolling Meadows, USA: Information and Tecnology Governance Institute.

Ittner, Christopher D, & Larcker, David F. (2003). Coming up short on nonfinancial performance measurement. *Harvard Business Review, 81*(11), 88-95.

Jakobs, Kai. (2007). ICT Standards Development - Finding the Best Platform. In Guy Doumeingts, Jörg Müller, Gerard Morel & Bruno Vallespir (Eds.), *Enterprise Interoperability* (pp. 543-552). London: Springer-Verlag London.

Janssen, Sylvana, Benetyte, Asta, Pileicikaite, Lina, König, Brigitte, Dyck, Evelyne Van, Puigdecanet, Anna, et al. (2007). *Flexibility of the Fringe Benefits in the European Union*.

Jensen, Michael, & Murphy, Kevin. (1990). CEO incentives: it's not how much you pay, but how. *Harvard Business Review, 68*(3), 138-153.

Jiang, Z, Xiao, Q, Qi, H, & Xiao, L. (2009). Total Reward Strategy: A Human Resources Management Strategy. Going with the Trend of the Times. *International Journal of Business and Management, 4*(11), 117-183.

Johns, Rob. (2010). Likert items and scales. *Survey Question Bank: Methods Fact Sheet*. Retrieved 2015, Mar 28, from http://surveynet.ac.uk/sqb/datacollection/likertfactsheet.pdf

Johnson, Vess. (2014). *Business-IT Alignment The impact of incentive plans on the development of shared vision.* (Doctor of Philosophy Thesis), University of North Texas, Denton, Texas, USA. Retrieved from http://search.proquest.com/docview/1720134642

Joseph, Kissan, & Thevaranjan, Alex. (1998). Monitoring and Incentives in Sales Organizations: An Agency-Theoretic Perspective. *Marketing Science, 17*(2), 107-123. doi: 10.1287/mksc.17.2.107

Kaplan, Robert S. (2010). *Conceptual Foundations of the Balanced Scorecard*. Working Paper 10-074. Harvard Business School, Harvard University. Cambridge, Massachusetts.

Kaplan, Robert S., & Norton, David P. (1996a). *The Balanced Scorecard: Translating Strategy Into Action*. Boston, MA: Harvard Business School Press.

Kaplan, Robert S., & Norton, David P. (1996b). Using the Balanced Scorecard as a Strategic Management System. *Harvard Business Review* (January-February), 75-85.

Kaplan, Robert S., & Norton, David P. (2004). Measuring the strategic readiness of intangible assets. *Harvard Business Review, 82*(2), 52-63.

Kaplan, Robert S., & Norton, David P. (2006). *Alignment: Using the balanced scorecard to create corporate synergies*. United States of America: Harvard Business School Publishing Corporation.

Kappelman, Leon, McLean, Eph, Johnson, Vess, & Torres, Russell. (2016). The 2015 SIM IT Issues and Trends Study. *MIS Quarterly Executive, 15*(1).

Kappelman, Leon, McLean, Ephraim, Johnson, Vess, & Gerhart, Natalie. (2014). The 2014 SIM IT key issues and trends study. *MIS Quarterly Executive, 13*(4), 237-263.

Kappelman, Leon, McLean, Ephraim, Luftman, Jerry, & Johnson, Vess. (2013). Key Issues of IT Organizations and Their Leadership The 2013 SIM IT Trends Study. *MIS Quarterly Executive, 12*(4), 227-240.

Karahanna, Elena, Straub, Detmar W, & Chervany, Norman L. (1999). Information technology adoption across time: a cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS quarterly*, 183-213.

Karten, Naomi. (2003). *How to Establish Service Level Agreements*. Randolph, Massachusetts, USA: Naomi Karten Associates.

Kathuria, Ravi, Joshi, Maheshkumar P, & Porth, Stephen J. (2007). Organizational alignment and performance: Past, present and future. *Management Decision, 45*(3), 503-517.

Kearns, G. S., & Lederer, A. L. (2000). The effect of strategic alignment on the use of IS-based resources for competitive advantage. *Journal of Strategic Information Systems, 9*(4), 265-293.

Kearns, G. S., & Lederer, A. L. (2003). A resource-based view of strategic IT alignment: How knowledge sharing creates competitive advantage. *Decision Sciences, 34*(1), 1-29.

Kimberlin, Carole L, & Winterstein, Almut G. (2008). Validity and reliability of measurement instruments used in research. *American Journal of Health-System Pharmacy, 65*(23), 2276-2284.

Koch, Sabine C, Muller, Stephanie M, Schroeer, Antje, Thimm, Caja, Kruse, Lenelis, & Zumbach, Joerg. (2005). Gender at Work: Eavesdropping on Communication Patterns in Two Token Teams. In L. Anolli, S. Duncan Jr., M. S. Magnusson & G. Riva (Eds.), *The Hidden Structure of Interaction: From Neurons to Culture Patterns*. Amsterdam: IOS Press.

Kock, Ned. (2015). One-tailed or two-tailed P values in PLS-SEM? *International Journal of e-Collaboration (IJeC), 11*(2), 1-7.

Kothari, CR, & Garg, Gaurav. (2014). *Research methodology: Methods and techniques*. New Delhi: New Age International.

Kouakou, Claude N. (2013). *Information Technology Governance Maturity: Examining the Moderating Effect on the Relationship Between Strategic Alignment Maturity and Information Technology Effectiveness* (Doctor of Philosophy Thesis), Capella University, Minnesota, United States.

Kouzes, James, & Posner, Barry. (2006). Enlist Others. In JV Gallos & EH Schein (Eds.), *Organization development*. San Francisco, United States of America: Jossey-Bass, John Wiley & Sons, Inc.

KPMG. (2013). *Top Eight Risk Management Imperatives for the C-suite in 2013. Expectations of Risk Management Outpacing Capabilities - It´s Times For Action Risk Executive Summary*. KPMG International Cooperative.

KPMG. (2015). *Global CEO Outlook 2015: The growth imperative in a more competitive environment*. U.S.A.: KPMG International Cooperative.

Krugman, Paul. (2009). *The return of depression economics and the crisis of 2008* (First ed.). New York, London: WW Norton & Company.

Kuruppuarachchi, Palitha R, Mandal, Purnendu, & Smith, Ross. (2002). IT project implementation strategies for effective changes: a critical review. *Logistics Information Management, 15*(2), 126-137.

Kyriazis, Dimosthenis. (2013). *Cloud Computing Service Level Agreements*. Brussels: European Commission Directorate General Communications Networks, Content and Technology, Unit E2 - Software ans Services, Cloud.

Laboratory for Automation Psychology at University of Maryland Institute for Advanced Computer Studies, UMIACS. (2011). Online Survey Design Guide. Retrieved 2011, 10 January, 2011, from http://lap.umd.edu/survey_design/

Laffont, Jean-Jacques, & Martimort, David. (2001). *The theory of incentives: the principal-agent model*. Princeton University Press.

Lance, Danette. (2006). *Examining the CEO CIO Disconnect Using Luftman's Strategic Alignment Maturity Assessment Model Five Years Later.* (Doctor of Philosophy Thesis), Capella University, Minneapolis, United States. Retrieved from http://search.proquest.com/docview/304909171

Lawshe, Charles H. (1975). A quantitative approach to content validity. *Personnel psychology, 28*(4), 563-575.

Lee, Sang M, Kim, Kihyun, Paulson, Patrick, & Park, Hyesung. (2008). Developing a socio-technical framework for business-IT alignment. *Industrial Management & Data Systems, 108*(9), 1167-1181.

Lee, Sangheon, McCann, Deirdre, & Messenger, Jon. (2007). *Working Time Around the World: Trends in working hours, laws, and policies in a global comparative perspective*. Oxon, United Kingdom: Routledge.

Lei 98/2009. (2009). *Regulamento do Regime de Reparação de Acidentes de Trabalho e de Doenças Profissionais*. Assembleia da República Portuguesa.

Lerner, Josh, & Wulf, Julie. (2007). Innovation and incentives: Evidence from corporate R&D. *The Review of Economics and Statistics, 89*(4), 634-644.

Lewis, Bruce R, Snyder, Charles A, & Rainer Jr, R Kelly. (1995). An empirical assessment of the information resource management construct. *Journal of Management Information Systems, 12*(1), 199-223.

Lindner, James R. (1998). Understanding employee motivation. *Journal of extension, 36*(3), 1-8.

LinkedIn. (2015). New for 2015: The Sophisticated Marketers Guide To. LinkedIn Corporation. Retrieved 2015, Dec 08, from https://business.linkedin.com/content/dam/business/g/en-us/pdf/lms/linkedin-sophisticated-marketers-guide-en-us.pdf

Locke, Edwin A, & Latham, Gary P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American psychologist, 57*(9), 705.

Locke, Edwin A, Shaw, Karyll N, Saari, Lise M, & Latham, Gary P. (1981). Goal setting and task performance: 1969–1980. *Psychological bulletin, 90*(1), 125.

Long, Karen J. (2004). Unit of Analysis. In Michael S. Lewis-Beck, Alan Bryman & Tim Futing Liao (Eds.), *Encyclopedia of Social Science Research Methods* (pp. 1158-1159). Thousand Oaks, CA: SAGE Publications, Inc.

Luftman, J. (2000). Assessing Business-IT Alignment Maturity. *Communications of the Association for Information Systems, 4*(14), 1-50.

Luftman, J., & Brier, T. (1999). Achieving and sustaining business-IT alignment. *California management review, 42*, 109-122.

Luftman, Jerry. (2003). Assessing IT/Business Alignment. *Information Systems Management, 20*(4), 9-15. doi: 10.1201/1078/43647.20.4.20030901/77287.2

Luftman, Jerry. (2004). Assessing Business-IT Alignment Maturity. In Wim Van Grembergen (Ed.), *Strategies for Information Technology Governance* (pp. 99-128). Hershey, United States of America: Idea Group Publishing.

Luftman, Jerry, & Ben-Zvi, Tal. (2010a). Key issues for IT executives 2009: Difficult economy's impact on IT. *MIS Quarterly Executive, 9*(1), 203-213.

Luftman, Jerry, & Ben-Zvi, Tal. (2010b). Key Issues for IT Executives 2010: Judicious IT Investments Continue Post-Recession. *MIS Quarterly Executive, 9*(4), 263-273.

Luftman, Jerry, & Ben-Zvi, Tal. (2011). Key Issues for IT Executives 2011: Cautious optimism in uncertain economic times. *MIS Quarterly Executive, 10*(4), 203-212.

Luftman, Jerry, Ben-Zvi, Tal, Dwivedi, Rajeev, & Rigoni, Eduardo Henrique. (2010). IT Governance: An alignment maturity perspective. *International Journal of IT/Business Alignment and Governance (IJITBAG), 1*(2), 13-25.

Luftman, Jerry, & Derksen, Barry. (2012). Key Issues for IT Executives 2012: Doing More with Less. *MIS Quarterly Executive, 11*(4), 207-218.

Luftman, Jerry, & Derksen, Barry. (2014). *European Key IT and Management Issues & Trends for 2014*. Mechelen, Belgium: CIONET International.

Luftman, Jerry, & Kempaiah, Rajkumar. (2007). An update on business-IT alignment:"a line" has been drawn. *MIS Quarterly Executive, 6*(3), 165-177.

Luftman, Jerry, Kempaiah, Rajkumar, & Rigoni, E. H. . (2009). Key Issues for IT Executives 2008. *MIS Quarterly Executive, 8*(3), 151-159.

Luftman, Jerry, Papp, R., & Brier, T. (1999). Enablers and inhibitors of business-IT alignment. *Communications of the Association for Information Systems, 1*(11), 1-33.

Luftman, Jerry, Wander, Frank, Nathan, Mark, & Sutaria, Harshil. (2013). Drawing 'align' in the sand: The cultural shift toward federating IT at guardian life insurance. *Journal of Information Technology Teaching Cases, 3*(2), 51-59.

Lunenburg, Fred C. (2011). Goal-Setting Theory of Motivation. *International Journal of Management, Business and Administration, 15*(1).

Majeed, Sadia. (2011). The Impact of Competitive Advantage on Organizational Performance. *European Journal of Business and Management, 3*(4), 191-196.

Management, Dictionary of Business and. (2006). Dictionary of Business and Management. A Dictionary of Business and Management. Retrieved April 4, 2010, from http://www.encyclopedia.com/doc/1O18-extrinsicreward.html

Marôco, João. (2010). *Análise de equações estruturais: Fundamentos teóricos, software & aplicações*. Pêro Pinheiro, Portugal: ReportNumber, Análise e Gestão de Informação, Lda.

Masli, Adi, Richardson, Vernon J, Watson, Marcia Weidenmier, & Zmud, Robert W. (2009). CEO, CFO & CIO Engagement in Information Technology Management: The Disciplinary Effects of Sarbanes-Oxley Information Technology Material Weaknesses*Proceedings of the University of Waterloo Centre for Information Integrity & Information Systems Assurance 6th Bi-Annual Research Symposium*.

Maslow, Abraham Harold. (1943). A theory of human motivation. *Psychological review, 50*(4), 370-396.

McAuley, E. (1989). Psychometric Properties of the Intrinsic Motivation Inventory in a Competitive Sport Setting: A Confirmatory Factor Analysis. *Research Quarterly for Exercise and Sport, 60*(1), 48-58.

McClure, David. (2000). *Maximizing the Success of the Chief Information Officers-Learning from Leading Organizations* (GAO/AIMD-00-83, March ed.). Washington: General Accounting Office United States.

McCrindle, Mark, & Wolfinger, Emily. (2009). *The ABC of XYZ: Understanding the global generations*. New South Wales, Australia: University of New South Wales Press Ltd.

Melé, Domènec. (2005). Exploring the principle of subsidiarity in organisational forms. *Journal of Business Ethics, 60*(3), 293-305.

Mendoza, Anabel Gutiérrez. (2009). *Alignment of IT projects with business strategy: An analysis of the interrelationships between the factors affecting IS alignment at strategic, tactical and operational levels.* (PhD Thesis), School of Information Systems, Computing and Mathematics, Brunel University, West London, UK.

Mendoza, G. (2009). *Alignment of IT projects with business strategy: An analysis of the interrelationships between the factors affecting IS alignment at strategic, tactical and operational levels.* (PhD), School of Information Systems, Computing and Mathematics, Brunel University, West London.

Microsoft. (2010). Microsoft Excel (Version 14.0.7163.5000). Microsoft Office Professional Plus 2010 Microsoft Corporation.

Mieiro, Ricardo José de Pinho, Morais, Angela Maria Silva Vieira Lança de, Mieiro, João Manuel de Pinho, Mieiro, Paulo Vieira do Nascimento, & Faustino, Rui António. (2014). *Relatório Consolidado de Gestão e Contas 2013 - ASCENDUM GRUPO*.

Miguel, António. (2010). *Miguel, 2010, Gestão de Projectos de Software* (4ª Edição ed.). Lisboa: FCA - Editora de Informática, Lda.

Miles, Raymond E, Snow, Charles C, Meyer, Alan D, & Coleman, Henry J. (1978). Organizational strategy, structure, and process. *Academy of management review, 3*(3), 546-562.

Milkovich, George T, Newman, Jerry M, & Gerhart, Barry. (2011). *Compensation* (10th edition ed.). New York: Richard D. Irwin/McGraw-Hill.

Minton, Henry Lee, & Schneider, Frank W. (1980). *Differential Psychology*. Belmont, CA: Brooks & Cole Publishing Company.

Mirani, R., & Lederer, A. L. (1998). An instrument for assessing the organizational benefits of IS projects. *Decision Sciences, 29*(4), 803-838.

Mohindra, Vinita, & Azhar, Samina. (2012). Gender Communication: A Comparative Analysis of Communicational Approaches of Men and Woman at Worplaces. *IOSR Journal of Humanities and Social Science (JHSS), 2*(1), 18-27.

Montepio Geral. (2015). PPR – Adesão Empresas. Retrieved Apr, 14, 2015, from https://www.montepio.pt/SitePublico/pt_PT/institucional/grupo/futuro-sa/empresas/ppr.page

Morse, Adair, Nanda, Vikram, & Seru, Amit. (2011). Are incentive contracts rigged by powerful CEOs? *The Journal of Finance, 66*(5), 1779-1821.

Murphy, Kevin, & Jensen, Michael. (1998). Performance pay and top management incentives.

Nash, Elby. (2006). *Assessing IT as a driver or enabler of transformation in the pharmaceutical industry employing the Strategic Alignment Maturity Model.* (Doctor of Philosophy Thesis), Stevens Institute o f Technology, Hoboken, New Jersey, United States.

Newsted, Peter, Huff, Sid, & Munro, Malcolm. (1998). Survey instruments in information systems. *MIS Quarterly, 22*(4), 553-554.

Newsted, Peter, Huff, Sid, Munro, Malcolm, & Schwarz, Andrew. (2012). Survey Instruments in Information Systems Repository. Retrieved 2012, Mar 12, from AIS, Association for Information Systems http://survey.aisnet.org/

Nonaka, Ikujiro. (1994). A dynamic theory of organizational knowledge creation. *Organization science, 5*(1), 14-37.

OECD. (2015a). *How does health spending in PORTUGAL compare?* Paris: The Organisation for Economic Co-operation and Development (OECD).

OECD. (2015b). *Reviews of Health Care Quality: Portugal 2015*. Paris: The Organisation for Economic Co-operation and Development (OECD).

OECD. (2015c). Work-Life Balance. Retrieved 2016, Mar 22, 2016, from http://www.oecdbetterlifeindex.org/topics/work-life-balance/

OPM. (2014). *Federal Employee Benefit Programs: Results from de 2013 Federal Employee Benefits Survey*. Washington: United States Office of Personnel Management.

Orlikowski, W.J. (1992). The duality of technology: Rethinking the concept of technology in organizations. *Organization science*, 398-427.

Orvill, Adams, & Hicks, Vern. (2000). Pay and non-pay incentives, performance and motivation. *Human Resources Development Journal, 4*(3), 25.

Osborne, Jason W, & Overbay, Amy. (2004). The power of outliers (and why researchers should always check for them). *Practical assessment, research & evaluation, 9*(6), 1-12.

Owens, Dawn, & Khazanchi, Deepak. (2011). Best Practices for Retaining Global IT Talent*System Sciences (HICSS), 2011 44th Hawaii International Conference on* (pp. 1-12). IEEE.

Palmer, Jonathan W, & Markus, M Lynne. (2000). The performance impacts of quick response and strategic alignment in specialty retailing. *Information systems research, 11*(3), 241-259.

Papp, Raymond. (1999). Business-IT alignment: productivity paradox payoff? *Industrial Management & Data Systems, 99*(8), 367-373.

Peak, D, Guynes, CS, & Kroon, V. (2005). Information technology alignment planning—a case study. *Information & Management, 42*(5), 635-649.

Pedrosa, Isabel. (2015). *Computer-Assisted Audit Tools and Techniques Use: Determinants for Individual Acceptance.* (A Thesis presented in partial fulfilment of the Requirements for the Degree of Doctor in Information Science and Technology), ISCTE - University Institute of Lisbon.

Peppard, J., & Ward, J. (2004). Beyond strategic information systems: towards an IS capability. *Journal of Strategic Information Systems, 13*(2), 167-194. doi: 10.1016/j.jsis.2004.02.002

Peterson, Robert A. (1994). A meta-analysis of Cronbach's coefficient alpha. *Journal of consumer research*, 381-391.

Petri, Herbert L., & Cofer, Charles N. (2013). Motivation. Encyclopædia Britannica, Inc. Retrieved 2013, May 30, from http://www.britannica.com/EBchecked/topic/394212/motivation

Pilcher, Terry. (1999). Company benchmarking as a tool to aid competitiveness. *The TQM Magazine, 11*(1), 49-53.

Pink, Daniel. (2005). *A whole new mind*: Riverhead Books.

Pinsonneault, Alain, & Oh, Wonseok. (2007). On the assessment of the strategic value of information technologies: Conceptual and Analytical Approaches. *Mis Quarterly, 31*(2), 239-265.

Policonomics. (2013). Moral hazard. Retrieved Sep 05, 2013, from Policonomics http://www.policonomics.com/moral-hazard/

Popper, Karl. (2005). *The Logic of Scientific Discovery*. London, UK and New York, USA: Routledge, Taylor & Francis Group. (Original work published 1959).

Porter, Michael E. (1979). How competitive forces shape strategy. *Harvard Business Review*(57), 137-145.

Porter, Michael E. (1985). *Competitive advantage: Creating and sustaining superior performance*. London, UK: Collier Macmillan.

Porter, Michael E. (1996). From competitive advantage to corporate strategy. In Michael Goold and Katleen Soomers (Ed.), *Managing the Multibusiness Company: Strategic Issues for diversified groups* (First ed.). London: Routledge.

Prado, José. (2009). *Strategic Business and IT Alignment Assessment: A modeling approach associated with enterprise arquitecture.* (PhD), KTH, Royal Institute of Tecnology, Stockholm, Sweden.

Presser, Stanley, Couper, Mick P, Lessler, Judith T, Martin, Elizabeth, Martin, Jean, Rothgeb, Jennifer M, et al. (2004). Methods for testing and evaluating survey questions. *Public Opinion Quarterly, 68*(1), 109-130.

Preston, David S, & Karahanna, Elena. (2009). Antecedents of IS strategic alignment: a nomological network. *Information Systems Research, 20*(2), 159-179.

Prieto, Vanderli Correia, & Carvalho, Marly Monteiro. (2011). Strategic alignment and performance: Brazilian companies in the medical diagnostics sector. *The Service Industries Journal, 31*(9), 1405-1427.

Procaccino, J Drew, Verner, June M, Overmyer, Scott P, & Darter, Marvin E. (2002). Case study: factors for early prediction of software development success. *Information and software technology, 44*(1), 53-62.

Project 2061. (1989). *Science for all Americans: A Project 2061 report on literacy goals in science, mathematics, and technology* (Vol. 89): American Association for the Advancement of Science.

Psychology Dictionary. (2013). Negative incentive. http://psychologydictionary.org/negative-incentive/

PwC. (2008). *How to Design a Shared Service Center that Works*. In Paul Horowitz, Charles Aird, Robert Scheier, Matthew Shocklee, David Gordon & Neil Hersh (Eds.): Advisory Services Sourcing. PricewaterhouseCoopers LLP.

Queiroz, Dayane Cristina de. (2010). Estratégias de Renumeração e Plano de Carreiras. *Revista da Faculdades Santa Cruz, 8*(2), 87-96.

Ramalho, João Magalhães. (2013). Tributação Autónoma - Dos Bónus e outras Remunerações Variáveis Pagas a Administradores, Gerentes ou Gestores. Portugal Funds People. Retrieved 2013, Jun 05, from http://www.fundspeople.pt/noticias/tributacao-autonoma-dos-bonus-e-outras-remuneracoes-variaveis-pagas-a-administradores-gerentes-ou-gestores-67479

Redmond, Francis, & Padgett, Lauren. (2014). Goal Setting Theory Overview. Retrieved 2015, Jul 16, from https://wikispaces.psu.edu/display/PSYCH484/6.+Goal+Setting+Theory

Reich, Blaize Horner, & Benbasat, Izak. (1996). Measuring the linkage between business and information technology objectives. *MIS Quarterly, 20*(1), 55-81.

Reich, Blaize Horner, & Benbasat, Izak. (2000). Factors that influence the social dimension of alignment between business and information tecnology objectives. *MIS Quarterly, 24*(1), 81-113.

Reis, João Pena dos, Pereira, Albertina, Reis, Viriato, & Ravara, Diogo. (2013) Retribuição e Outras Atribuições Patrimoniais. *Coleção Formação Inicial. Jurisdição do Trabalho e da Empresa*. Lisboa: Centro de Estudos Judiciários.

Reward. (2009). Available from The American Heritage Dictionary of the English Language Houghton Mifflin Company Retrieved 2013, June 04, from http://www.thefreedictionary.com/reward

Ringle, Christian M., Sarstedt, Marko, & Straub, Detmar W. (2012). A Critical Look at the Use of PLS-SEM in MIS Quarterly. *MIS Quarterly, 36*(1), iii-xiv.

Ringle, Christian, Wende, Sven, & Will, Alexander. (2005). SmartPLS (Version 2.0.M3). Hamburg. Retrieved from http://www.SmartPLS.de

Roszkowski, Michael J, & Soven, Margot. (2010). Shifting gears: Consequences of including two negatively worded items in the middle of a positively worded questionnaire. *Assessment & Evaluation in Higher Education, 35*(1), 113-130.

Roy, Subhadip, Tarafdar, Monideepa, Ragu-Nathan, TS, & Erica, Marsillac. (2012). The Effect of Misspecification of Reflective and Formative Constructs in Operations and Manufacturing Management Research. *Electronic Journal of Business Research Methods, 10*(1).

Russo, Simony Jara, Viana, José Jair Soares, & Hall, Rosemar José. (2007). *Remuneração Variável: uma Ferramenta Estratégica para as Organizações*. Paper presented at the Simpósio de Excelência em Gestão e Tecnologia, Rio de Janeiro, Brasil. http://www.aedb.br/seget/artigos07/1162_1162_Remuneracao%20variavel.pdf

Ryan, Nick. (2013). *Reward Schemes for Employees and Management*. London, United Kingdom: Association of Chartered Certified Accountants (ACCA).

Ryan, Richard, & Deci, Edward. (2000a). Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions* 1. *Contemporary educational psychology, 25*(1), 54-67.

Ryan, Richard, & Deci, Edward. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychologist, 55*(1), 68-78.

Ryan, Timothy. (2010). *Business-IT Alignment Maturity: The Correlation of Performance Indicators and Alignment Maturity within the Commercial Airline Industry.* (Doctor of Philosophy Thesis), Capella University, Minnesota, United States.

Rynes, Sara L, Brown, Kenneth G, & Colbert, Amy E. (2002). Seven common misconceptions about human resource practices: Research findings versus practitioner beliefs. *The Academy of Management Executive, 16*(3), 92-103.

Sabherwal, Rajiv, & Chan, Yolande E. (2001). Alignment between business and IS strategies: A study of prospectors, analyzers, and defenders. *Information Systems Research, 12*(1), 11-33.

Sányová, Barbara, Buzady, Zoltan, Bennett, Clive Viegas, & Brewster, Chris. (2015). *Can CEE Management Compete?* : Target International Executive Search & Central European University.

Schein, Edgar H. (1996). Career anchors revisited: Implications for career development in the 21st century. *The Academy of Management Executive, 10*(4), 80-88.

Schneiderman, Arthur M. (1999). Why balanced scorecards fail. *Journal of Strategic Performance Measurement, 3*, 6-11.

Scott, RA, Currie, GV, & Tivendale, KJ. (2012). *Company cars and fringe benefit tax - Understanding the impacts on strategic transport targets February 2012*. Wellington, New Zealand: NZ Transport Agency.

Segars, A.H., & Grover, V. (1999). Profiles of strategic information systems planning. *Information Systems Research, 10*(3), 199-232.

Segars, A.H., Grover, V., & Teng, J.T.C. (1998). Strategic information systems planning: planning system dimensions, internal coalignment, and implications for planning effectiveness. *Decision Sciences, 29*(2), 303-341.

Sengupta, Ishita, Baldwin, Marjorie, & Reno, Virginia. (2013). Benefits, Coverage, and Costs.

Sengupta, Ishita, Reno, Virginia P, Burton Jr, John F, & Baldwin, Marjorie L. (2012). Workers' compensation: Benefits, coverage, and costs, 2010. *National Academy of Social Insurance*.

Sethi, Vijay, & King, William R. (1994). Development of measures to assess the extent to which an information technology application provides competitive advantage. *Management science, 40*(12), 1601-1627.

Siggelkow, Nicolaj. (2001). Change in the presence of fit: The rise, the fall, and the renaissance of Liz Claiborne. *Academy of Management Journal, 44*(4), 838-857.

Silvius, AJ Gilbert. (2007). Exploring differences in the perception of business & IT alignment. *Communications of the International Information Management Association (IIMA) Conference, 7*(2), 21.

Simon, Marilyn K, & Goes, Jim. (2011). *Dissertation and Scholarly Research: Recipes for Success*: CreateSpace Independent Publishing Platform.

Simons, Neil. (2010). Leveraging generational work styles to meet business objectives. *Information Management, 44*(1), 28.

Sinickas, Angela. (2001). Communicating is not optional. *Harvard Business School Publishing Corporation, Harvard Management Communication Letter*(2001), 1-5.

Skarupova, Katerina. (2014). *Computer-assisted and Online Data Collection in General Population Surveys*: The European Monitoring Centre for Drugs and Drug Addiction.

Sledgianowski, D., Luftman, Jerry, & Reilly, R.R. (2008). Development and validation of an instrument to measure maturity of IT business strategic alignment mechanisms. In Mehdi Khosrow-Pour (Ed.), *Innovative Technologies for Information Resources Management* (pp. 229-245). Hershey, New York: Information Science Reference, IGI Global.

Smith, Avery. (2014). *The relationship between the strategic thinking capability and IT alignment maturity of Chief Information Officers (CIO) and senior IT leadership in higher education An exploratory study.* (Doctor of Philosophy Thesis), George Fox University, Newberg, Oregon, USA. Retrieved from http://search.proquest.com/docview/1747076295

Snowden, Suzanne, & Cheah, Poh-Khim. (2016). *Redefining Business sucess in a Changing World: 19th annual global CEO Survey*. United Kindom: The Design Group PwC.

Solomon, DJ. (2001). Conducting web-based surveys. *Practical Assessment Research and Evaluation, 7*(19).

Sonnentag, Sabine, & Frese, Michael. (2001). Performance Concepts and Performance Theory. In Sabine Sonnentag (Ed.), *Psychological Management of Individual Performance* (pp. 3-25): John Wiley & Sons, Ltd.

Star, Susan Leigh, & Ruhleder, Karen. (1996). Steps toward an ecology of infrastructure: Design and access for large information spaces. *Information systems research, 7*(1), 111-134.

StatCounter. (2015). Top 9 Browsers on Nov 2015. StatCounter. Retrieved 2015, Nov 06, from http://gs.statcounter.com/#all-browser-ww-monthly-201511-201511-bar

Stolovitch, H, Clark, R, & Condly, S. (2002). *Incentives, Motivation & Workplace Performance: Research & Best Practices*. New York: International Society for Performance Improvement (ISPI) & The Incentive Research Foundation.

Straub, Detmar W. (1989). Validating instruments in MIS research. *MIS Quarterly*, 147-169.

Straub, Detmar W., Boudreau, M.C., & Gefen, D. (2004). Validation guidelines for IS positivist research. *Communications of the Association for Information Systems, 13*(24), 380-427.

Tallon, Paul P, & Kraemer, Kenneth L. (2003). Investigating the relationship between strategic alignment and IT business value: the discovery of a paradox. *Creating Business Value with Information Technology: Challenges and Solutions. Hershey, PA: Idea Group Publishing*, 1-22.

Tarafdar, Monideepa, & Qrunfleh, Sufian. (2009). IT-Business Alignment: A Two-Level Analysis. *Information Systems Management, 26*(4), 338–349.

Tarhini, Ali, Hone, Kate, & Liu, Xiaohui. (2014). The effects of individual differences on e-learning users' behaviour in developing countries: A structural equation model. *Computers in Human Behavior, 41*, 153-163.

Taylor, Sharon. (2007). *The Official Introduction to the ITIL Service Lifecycle*. London: The Stationary Office.

Teo, Thompson SH, & King, William R. (1996). Assessing the impact of integrating business planning and IS planning. *Information & Management, 30*(6), 309-321.

Terzis, Vasileios, & Economides, Anastasios A. (2011). Computer based assessment: Gender differences in perceptions and acceptance. *Computers in Human Behavior, 27*(6), 2108-2122.

Ticket. (2015). Ticket Serviços. Retrieved April, 12, 2015, from http://www.ticket.pt/

Trainor, Ed. (2011). Foreword. In Jerry Luftman (Ed.), *Managing IT Human Resources: Considerations for Organizations and Personnel*. Hershey, Pennsylvania, USA: Business Science Reference.

Trochim, William MK, & Donnelly, James P. (2008). *Research methods knowledge base*. Mason, OH: Atomic Dog/Cengage Learning.

Twaronite, Karyn, & Poll, Harris. (2015). *Global Generations: A Global Study on Work Life Challenges across Generations*: Ernst & Young Global Limited.

Ullman, JB. (2006). Structural equation modeling: Reviewing the basics and moving forward. *Journal of Personality Assessment, 87*(1), 35-50.

Unerman, Jeffrey, Guthrie, James, & Striukova, Ludmila. (2007). *UK Reporting of Intellectual Capital: ICAEW Centre for Business Performance*. London: Centre for Business Performance, Chartered Accountants' Hall.

Vallerand, R.J., Pelletier, L.G., Blais, M.R., Briere, N.M., Senecal, C., & Vallieres, E.F. (1992). The Academic Motivation Scale: A measure of intrinsic, extrinsic, and amotivation in education. *Educational and Psychological Measurement, 52*(4), 1003.

Vallerand, RJ, Pelletier, LG, Blais, MR, Briere, NM, Senecal, C, & Vallieres, EF. (1993). On the assessment of intrinsic, extrinsic, and amotivation in education: Evidence on the concurrent and construct validity of the Academic Motivation Scale. *Educational and Psychological Measurement, 53*(1), 159.

Van Grembergen, Wim, & De Haes, Steven. (2015). *Enterprise Governance of Information Technology: Achieving Alignment and Value, Featuring COBIT 5* (Second Edition ed.). Antwerp, Belgium: Springer International Publishing.

van Teijlingen, Edwin, & Hundley, Vanora. (2001). The importance of pilot studies. *Social research update*(35), 1-4.

Venkatraman, Natarajan Venkat. (1989). The concept of fit in strategy research: Toward verbal and statistical correspondence. *Academy of management review*, 423-444.

Venkatraman, Natarajan Venkat, & Grant, John H. (1986). Construct measurement in organizational strategy research: A critique and proposal. *Academy of management Review, 11*(1), 71-87.

Vera, Dusya, & Crossan, Mary. (2004). Strategic leadership and organizational learning. *Academy of Management Review, 29*(2), 222-240.

Vinodh, S, & Joy, Dino. (2012). Structural equation modelling of lean manufacturing practices. *International Journal of Production Research, 50*(6), 1598-1607.

Viswesvaran, Chockalingam. (2001). Assessment of individual job performance: A review of the past century and a look ahead. *Handbook of industrial, work and organizational psychology, 1*, 110-126.

Vithayathil, Joseph. (2011). *An Information Asymmetry model of Information Technology (IT) Governance*: University of California, Irvine.

Vroom, Victor Harold. (1964). *Work and Motivation*. New York: John Wiley & Sons.

Ware, Mark. (2008). Peer review: benefits, perceptions and alternatives. *Publishing research consortium, 4*.

WEF, & INSEAD. (2015). *The Global Information Technology Report 2015: ICTs for Inclusive Growth*. In Soumitra Dutta, Thierry Geiger & Bruno Lanvin (Eds.). Geneva: World Economic Forum.

Weston, Rebecca, & Gore, Paul A. (2006). A brief guide to structural equation modeling. *The Counseling Psychologist, 34*(5), 719-751.

Wetzels, Martin, Odekerken-Schröder, Gaby, & Van Oppen, Claudia. (2009). Using PLS path modeling for assessing hierarchical construct models: Guidelines and empirical illustration. *MIS quarterly, 33*(1), 177-196.

Windley, Phillip J. (2002). *Modular IT Organization Utah State Government*. Utah, USA.

Wong, Ken Kwong-Kay. (2013). Partial least squares structural equation modeling (PLS-SEM) techniques using SmartPLS. *Marketing Bulletin, 24*(1), 1-32.

WorldatWork. (2008). *Total Rewards Model*. Scottsdale, Arizona, USA: WorldatWork Association.

WorldatWork. (2011). *Seven Categories of Work-Life Effectiveness*. Scottsdale: WorldatWork.

Wrzesniewski, A., McCauley, C., Rozin, P., & Schwartz, B. (1997). Jobs, careers, and callings: People's relations to their work. *Journal of research in personality, 31*, 21-33.

WTTC. (2015). *Travel & Tourism: Economic Impact 2015 Portugal*. London: World Travel & Tourism Council (WTCC).

Xu, Henrik. (2012). *Tablet application GUI usability checklist.* (Bachelor Thesis on IT, Media and Design), Södertörn University, Stockholm, Sweden.

Young, Raymond, & Jordan, Ernest. (2008). Top management support: Mantra or necessity? *International Journal of Project Management, 26*(7), 713-725.

Yu, Hui-Chun, & Miller, Peter. (2005). Leadership style: The X Generation and Baby Boomers compared in different cultural contexts. *Leadership & Organization Development Journal, 26*(1), 35-50.

APPENDIXES

Appendix 1: Excerpt of concepts' matrix of the literature review

Reference	Number of citations at Google Academic	Balanced Scorecard	Information technology governance	Business processes	Strategic information systems	Beneficial impact of alignment	Achieving alignment	Level of alignment	Strategic fit	Alignment Sequence	Alignment approaches	Sustaining alignment	Formal represent. of strategy
Kaplan, Robert S., & Norton, David P., 1996, The Balanced Scorecard: Translating Strategy Into Action	9.764	X	X	X	X	X	X	X	X	X	X	X	X
Kaplan and Norton, 1996, Using de Balanced Scorecard as a Strategic Management System	6.720	X		X	X	X	X		X	X			X
Henderson & Venkatraman, 1999,Strategic alignment: leveraging information technology for transforming organizations	3.015		X	X		X	X		X	X	X		
Reich & Benbasat, 2000, Factors that influence the social dimension of alignment between business and information technology objectives	1.251		X	X			X	X	X				X
Chan et al, 1997, Business strategic orientation, information systems orientation and strategic alignment	1.243					X	X	X	X				X
Sabherwal & Chan, 2001, Alignment between business and IS strategies - A study of prospectors, analyzers, and defenders	1.034					X	X	X	X		X		
Kaplan and Norton, 2004, Measuring the Strategic Readiness of Intangible Assets	1.009	X	X	X	X	X	X	X		X	X		X
Luftman, 2000, Assessing Business-IT Alignment Maturity	918		X	X		X	X	X	X				X
Reich and Benbasat, 1996, Measuring the linkage between business and information technology objectives	917							X	X				X
Kaplan and Norton, 2006, Alignment	875	X	X		X	X	X		X	X	X	X	X
Chan Y, Reich B.,2007, IT alignment: what have we learned?	754		X	X	X	X	X	X	X	X			X
Henderson & Venkatraman, 1992, Strategic alignment: A model for organizational transformation through information technology	656		X	X		X	X		X	X	X		
Luftman and Brier, 1999, Achieving and Sustaining Business-IT Alignment	655		X	X		X	X	X	X	X		X	X
Peppard, J. & J. Ward, 2004, Beyond strategic information systems: towards an IS capability	579			X	X	X	X		X		X		
Luftman et al, 1999, Enablers and Inhibitors of Business-IT Alignment	529		X	X		X							
Avison, D., Jones, J., Powell, P. and Wilson, D., 2004, Using and validating the strategic alignment model	510		X	X		X	X		X	X	X		

Appendix 2: English version of the instrument used at pretest

About incentives

	Compensation	1 strongly disagree	2	3	4	5 strongly agree
I01	I receive fair base wage for my job compared to others doing similar work at other companies	☐	☐	☐	☐	☐
I02	My company offers a generous premium increases in payment for on-call work or valued special skills	☐	☐	☐	☐	☐
I03	I am pleased because I'm earning more for what I do if I largely exceed the objectives	☐	☐	☐	☐	☐
	Benefits	1 strongly disagree	2	3	4	5 strongly agree
I04	I feel my company do not meet legal obligation benefits to each employee (R)	☐	☐	☐	☐	☐
I05	My company's offers medical plans or other health or welfare benefits that meet my needs	☐	☐	☐	☐	☐
I06	I feel the retirement benefits offered by my company meet employees needs	☐	☐	☐	☐	☐
	Performance & Recognition	1 strongly disagree	2	3	4	5 strongly agree
I07	I understand the measures used to evaluate my objectives	☐	☐	☐	☐	☐
I08	I regularly participate in the company's decision making and on the performance management system	☐	☐	☐	☐	☐
I09	I enjoy doing my activity very much	☐	☐	☐	☐	☐
I10	My skills are effectively used on the job	☐	☐	☐	☐	☐
I11	At my company, I am recognized for my accomplishments	☐	☐	☐	☐	☐

About incentives (continuation)

	Work-life	1 strongly disagree	2	3	4	5 strongly agree
I12	My current position permits me to experience the chance to do things my own way and not to be constrained by the rules of an organization	☐	☐	☐	☐	☐
I13	I can arrange my work schedule to meet my personal and/or family needs	☐	☐	☐	☐	☐
I14	It is difficult for me to get time off because of maternity/paternity or sabbatical reasons (R)	☐	☐	☐	☐	☐
I15	It is important for me to have health or wellness initiatives and services, like on-site fitness facilities, that are offered by my company	☐	☐	☐	☐	☐
I16	I am proud to be working at my company because my work and my company makes the world a better place	☐	☐	☐	☐	☐
I17	My current position permits me to experience a career in which I can be committed and devoted to an important cause	☐	☐	☐	☐	☐
I18	My company helps employees caring for their child and dependents	☐	☐	☐	☐	☐
I19	My company offers financial support to meet my family needs, like education ones	☐	☐	☐	☐	☐
I20	I don´t give so much importance to benefits offered like parking, employee discounts or car/home insurance (R)	☐	☐	☐	☐	☐
I21	My company does not value teamwork and diversity	☐	☐	☐	☐	☐
I22	Senior managers listen to me and care about my ideas	☐	☐	☐	☐	☐
I23	My current position permits me to experience remaining in my area of expertise throughout my career	☐	☐	☐	☐	☐
I24	My company provides me with the necessary data and technological resources to do my job well	☐	☐	☐	☐	☐

	Development & Career opportunities	1 strongly disagree	2	3	4	5 strongly agree
I25	My work allows me with opportunities for increasing my knowledge and skills	☐	☐	☐	☐	☐
I26	My supervisor is an effective role model for me	☐	☐	☐	☐	☐
I27	My current position permits me to develop a career that permits to continue to pursue my own lifestyle	☐	☐	☐	☐	☐
I28	My current position permits me to success by being constantly challenged by a tough problem or a competitive situation	☐	☐	☐	☐	☐

About alignment

	Communications	1 No/poor process (no alignment)	2 Beginning process	3 Establishing process	4 Improved process	5 Optimal process (complete alignment)
A01	Understanding of business by IT	☐ IT management lacks understanding	☐ limited understanding by IT management	☐ good understanding by IT management	☐ Understanding encouraged among IT staff	☐ understanding required of all IT staff
A02	Understanding of IT by business	☐ Managers lack understanding	☐ Limited understanding by managers	☐ Good understanding by managers	☐ Understanding encouraged among staff	☐ Understanding required of staff
A03	Organizational learning	☐ Casual conversation and meetings	☐ Newsletters, reports, group e-mail	☐ Training, departmental meetings	☐ Formal methods sponsored by senior	☐ Learning monitored for effectiveness
A04	Style and ease of access	☐ Business to IT only; formal	☐ One-way, somewhat informal	☐ Two-way, formal	☐ Two-way, somewhat informal	☐ Two-way, informal and flexible
A05	Leveraging intellectual assets	☐ Ad hoc	☐ Some structured sharing emerging	☐ Structured around key processes	☐ Formal sharing at all levels	☐ Formal sharing with partners
A06	IT–business liaison staff	☐ None or use only as needed	☐ Primary IT–Business link	☐ Facilitate knowledge transfer	☐ Facilitate relationship building	☐ Building relationship with partners
	Competency/Value measurements					
A07	IT metrics	☐ Technical only	☐ Technical cost; metrics rarely reviewed	☐ Review, act on technical, ROI metrics	☐ Also measure effectiveness	☐ Also measure business ops, HR, partners
A08	Business metrics	☐ IT investments measured rarely, if ever	☐ Cost/unit; rarely reviewed	☐ Review, act on ROI, cost	☐ Also measure customer value	☐ Balanced scorecard, includes partners
A09	Link between IT and business metrics	☐ Value of IT investments rarely measured	☐ Business, IT metrics not linked	☐ Business, IT metrics becoming linked	☐ Formally linked; reviewed and acted upon	☐ Balanced scorecard, includes partners
A10	Service level agreements	☐ Use sporadically	☐ With units for technology performance	☐ With units; becoming enterprise wide	☐ Enterprise wide	☐ Includes partners

About alignment (continuation)

Competency/Value measurements

A11	Benchmarking	☐ Seldom or never	☐ Sometimes benchmark informally	☐ May benchmark formally, seldom act	☐ Routinely benchmark, usually act	☐ Routinely benchmark, act on, and measure results
A12	Formally assess IT investments	☐ Do not assess	☐ Only when there is a problem	☐ Becoming a routine occurrence	☐ Routinely assess and act on findings	☐ Routinely assess, act on, and measure results
A13	Continuous improvement practices	☐ None	☐ Few; effectiveness not measured	☐ Few; starting to measure effectiveness	☐ Many; frequently measure effectiveness	☐ Practices and measures well-established

Governance

A14	Formal business strategy planning	☐ Not done, or done as needed	☐ At unit functional level, slight IT input	☐ Some IT input and cross-functional planning	☐ At unit and enterprise, with IT	☐ With IT and partners
A15	Formal IT strategy planning	☐ Not done, or done as needed	☐ At unit functional level, light business input	☐ Some business input and cross-functional planning	☐ At unit and enterprise, with business	☐ With partners
A16	Organizational structure	☐ Centralized or decentralized	☐ Central / decentral; some collocation	☐ Central / decentral or Federal	☐ Federal	☐ Federal
A17	Reporting relationships	☐ CIO reports to CFO	☐ CIO reports to CFO	☐ CIO reports to COO	☐ CIO reports to COO or CEO	☐ CIO reports to CEO
A18	How IT is budgeted	☐ Cost center, spending is unpredictable	☐ Cost center by unit	☐ Some projects treated as investments	☐ IT treated as investment	☐ Profit center
A19	Rationale for IT spending	☐ Reduce costs	☐ Productivity, efficiency	☐ Also a process enabler	☐ Process driver, strategy enabler	☐ Competitive advantage, profit
A20	Senior-level IT steering committee	☐ Do not have	☐ Meet informally as needed	☐ Formal committees meet regularly	☐ Proven to be effective	☐ Also includes external partners
A21	How projects are prioritized	☐ React to business or IT need	☐ Determined by IT function	☐ Determined by business function	☐ Mutually determined	☐ Partners' priorities are considered

About alignment (continuation)

Partnership

A22	Business perception of IT	☐ Cost of doing business	☐ Becoming an asset	☐ Enables future business activity	☐ Drives future business activity	☐ Partner with business in creating value
A23	IT's role in strategic business planning	☐ Not involved	☐ Enables business processes	☐ Drives business processes	☐ Enables or drives business strategy	☐ IT, business adapt quickly to change
A24	Shared risks and rewards	☐ IT takes all the risks, receives no rewards	☐ IT takes most risks with little reward	☐ IT, business start sharing risks, rewards	☐ Risks, rewards always shared	☐ Managers encouraged to take risks
A25	Managing the IT–business relationship	☐ IT–business relationship is not managed	☐ Managed on an ad hoc basis	☐ Processes exist but not always followed	☐ Processes exist and complied with	☐ Processes are continuously improved
A26	Relationship/trust style	☐ Conflict and mistrust	☐ Transactional relationship	☐ IT becoming a valued service provider	☐ Long-term partnership	☐ Partner, trusted vendor or IT services
A27	Business sponsors/champions technology scope	☐ Usually none	☐ Often have a senior IT sponsor or champion	☐ IT and business sponsor or champion at unit level	☐ Business sponsor or champion at corporate level	☐ CEO is the business sponsor or champion

Technology scope

A28	Technological and strategic sophistication of primary systems	☐ Traditional (e.g., accounting, email)	☐ Transaction (e.g., ESS, DSS)	☐ Expanded scope (e.g., business process enabler)	☐ Redefined scope (business process driver)	☐ External scope; Business strategy driver/enabler
A29	IT standards articulation and compliance	☐ None or ad-hoc	☐ Standards defined	☐ Emerging enterprise standards	☐ Enterprise standards	☐ Inter-enterprise standards
A30	Degree of architectural integration	☐ No formal integration	☐ Early attempts at integration	☐ Integrated across the organization	☐ Integrated with partners	☐ Evolved with partners

About alignment (continuation)

Technology scope

A31	Degree of infrastructure transparency	☐ None	☐ Limited	☐ Focused on communications	☐ Effective emerging technology management	☐ Across the infrastructure
A32	Degree of infrastructure flexibility	☐ None	☐ Limited	☐ Focused on communications	☐ Effective emerging technology management	☐ Across the infrastructure

Skills

A33	Innovative, entrepreneurial environment	☐ Discouraged	☐ Somewhat encouraged at unit level	☐ Strongly encouraged at unit level	☐ Also at corporate level	☐ Also with partners
A34	Key IT HR decisions made by:	☐ Top business and IT management at corporate	☐ Same, with emerging functional influence	☐ Top business and unit management; IT advises	☐ Top business and IT management across firm	☐ Top management across firm and partners
A35	Change readiness	☐ Tend to resist change	☐ Change readiness programs emerging	☐ Programs in place at functional level	☐ Programs in place at corporate level	☐ Also proactive and anticipate change
A36	Career crossover opportunities	☐ Job transfers rarely occur	☐ Occasionally occur within unit	☐ Regularly occur for unit management	☐ Regularly occur at all unit levels	☐ Also at corporate level
A37	Cross-functional training and job rotation	☐ No opportunities	☐ Decided by units	☐ Formal programs run by all units	☐ Also across enterprise	☐ Also with partners
A38	Social interaction	☐ Minimal IT–business interaction	☐ Strictly a business-only relationship	☐ Trust and confidence is starting	☐ Trust and confidence achieved	☐ Attained with customers and partners
A39	Attract and retain top talent	☐ No retention program; poor recruiting	☐ IT hiring focused on technical skills	☐ Technology and business focus; retention program	☐ Formal program for hiring and retaining	☐ Effective program for hiring and retaining

Appendix 3: Portuguese version of the instrument used at pretest

Sobre incentivos

	(SI1) **Remuneração**	1 Discordo Profun-damente	2	3	4	5 Concordo Profun-damente
I01	Eu recebo um salário-base justo pelo meu trabalho em comparação com outros que fazem um trabalho semelhante em outras empresas	☐	☐	☐	☐	☐
I02	A minha empresa oferece um generoso pagamento de prémio suplementar por trabalho urgente ou por competências importantes	☐	☐	☐	☐	☐
I03	Estou satisfeito, porque ganho mais pelo que faço se exceder amplamente os objetivos	☐	☐	☐	☐	☐
	Benefícios					
I04	A minha empresa não cumpre os benefícios obrigatórios legais para com cada funcionário (R)	☐	☐	☐	☐	☐
I05	A minha empresa oferece planos de saúde ou outros benefícios para a saúde ou bem-estar que atendem às minhas necessidades	☐	☐	☐	☐	☐
I06	Os benefícios na reforma oferecidos pela minha empresa satisfazem as necessidades dos seus funcionários	☐	☐	☐	☐	☐
	Desempenho e Reconhecimento					
I07	Eu entendo as medidas usadas na avaliação dos meus objetivos	☐	☐	☐	☐	☐
I08	Participo regularmente na tomada de decisão na empresa e no sistema de gestão de desempenho	☐	☐	☐	☐	☐
I09	Eu gosto muito de desempenhar a minha actividade	☐	☐	☐	☐	☐
I10	As minhas competências são efetivamente utilizadas no local de trabalho	☐	☐	☐	☐	☐
I11	Na minha empresa, eu sou reconhecido pelas minhas realizações	☐	☐	☐	☐	☐

	Vida profissional e familiar	1 Discordo Profun-damente	2	3	4	5 Concordo Profun-damente
I12	O meu cargo atual dá-me a oportunidade de fazer as coisas ao meu jeito, não sendo limitado por regras duma organização	☐	☐	☐	☐	☐
I13	Eu posso definir o meu horário de trabalho para atender às minhas necessidades pessoais e/ou familiares	☐	☐	☐	☐	☐
I14	É difícil para mim conseguir uma folga para apoio à maternidade/paternidade ou razões sabáticas	☐	☐	☐	☐	☐
I15	A minha empresa oferece serviços de saúde ou de bem-estar, como instalações de ginásio no local	☐	☐	☐	☐	☐
I16	Tenho orgulho em trabalhar na minha empresa porque o meu trabalho e a minha empresa ajudam a tornar o mundo melhor	☐	☐	☐	☐	☐
I17	O meu cargo atual permite-me experimentar uma carreira em que eu posso estar comprometido e dedicado a uma causa importante	☐	☐	☐	☐	☐
I18	A minha empresa ajuda os funcionários a cuidar dos seus filhos e dependentes	☐	☐	☐	☐	☐
I19	A minha empresa oferece apoio financeiro para satisfazer as minhas necessidades familiares, como as de educação	☐	☐	☐	☐	☐
I20	Eu tenho benefícios como o estacionamento, descontos de empregado ou seguro de carro/casa	☐	☐	☐	☐	☐
I21	A minha empresa não valoriza o trabalho em equipa e a diversidade (R)	☐	☐	☐	☐	☐
I22	Os gestores seniores ouvem-me e valorizam as minhas ideias	☐	☐	☐	☐	☐
I23	O meu cargo atual permite-me experimentar a minha área de especialização ao longo da minha carreira	☐	☐	☐	☐	☐
I24	A minha empresa dá-me os dados e os recursos tecnológicos necessários para fazer bem o meu trabalho	☐	☐	☐	☐	☐
	Desenvolvimento e Oportunidades de carreira					
I25	O meu trabalho proporciona-me oportunidades para aumentar os meus conhecimentos e as minhas competências	☐	☐	☐	☐	☐
I26	O meu supervisor é para mim efectivamente um modelo a seguir	☐	☐	☐	☐	☐
I27	O meu cargo atual permite-me desenvolver uma carreira que possibilita continuar a seguir o meu próprio estilo de vida	☐	☐	☐	☐	☐
I28	O meu cargo atual permite-me ter êxito por ser constantemente desafiado com um problema difícil ou uma situação de competição	☐	☐	☐	☐	☐

Sobre alinhamento

	Comunicação	1 Sem ou fraco processo (sem alinhamento)	2 Processo principiante	3 Processo definido	4 Processo melhorado	5 Processo otimizado (alinhamento completo)
A01	Entendimento do negócio pelas TI	☐ Sem entendimento pela gestão das TI	☐ Entendimento limitado pela gestão das TI	☐ Bom entendimento pela gestão das TI	☐ O entendimento do negócio é encorajado pela gestão das TI	☐ O entendimento do negócio é exigido em toda a equipa
A02	Entendimento das TI pela equipa do negócio	☐ Os gestores do negócio sem entendimento das TI	☐ Os gestores do negócio têm uma visão limitada das TI	☐ Bom entendimento pelos gestores do negócio das TI	☐ É encorajado o entendimento das TI na equipa do negócio	☐ É exigido o entendimento das TI na equipa do negócio
A03	Aprendizagem organizacional	☐ Apenas em conversas e reuniões fortuitas	☐ Através de newsletters, relatórios, emails de grupo	☐ Através de formação e reuniões departamentais	☐ Com métodos formais patrocinados por gestor sénior	☐ A aprendizagem é monitorizada para maior eficácia
A04	Estilo e facilidade na comunicação	☐ Apenas do negócio para a equipa das TI; formal	☐ De sentido único, um pouco informal	☐ Nos dois sentidos, formal	☐ Nos dois sentidos, um pouco informal	☐ Nos dois sentidos, informal e flexível
A05	Alavancagem de ativos intelectuais	☐ Ad hoc	☐ Alguma partilha estruturada a emergir	☐ Estruturada em torno de processos-chave	☐ Partilha formal em todos os níveis hierárquicos	☐ Partilha formal também com parceiros
A06	Pessoal de ligação das equipas de TI e do negócio	☐ Nenhuma ligação é promovida ou somente quando necessário	☐ Faculta uma ligação TI-Negócio preliminar	☐ Facilita a transferência de conhecimento	☐ Facilita a construção de relacionamentos	☐ Constrói também relacionamentos com parceiros
	Medição de Valor					
A07	Métricas das TI	☐ Apenas métricas técnicas	☐ Com custo técnico; métricas raramente revistas	☐ Com revisões, atuação sobre métricas técnicas e ROI	☐ Também se mede a eficácia	☐ Medem-se também opções no negócio, RH e de parceiros
A08	Métricas do negócio	☐ Os investimentos em TI raramente ou nunca são medidos	☐ Medição por custo unitário; raramente revistos	☐ Com revisões, atuação sobre ROI e custo	☐ Também se mede o valor para o cliente	☐ Com "Balanced Scorecard", inclui o valor para parceiros
A09	Ligação das métricas das TI e do negócio	☐ O valor dos investimentos em TI raramente é medido	☐ As métricas do negócio e das TI não estão ligadas	☐ As métricas do negócio e das TI começam a estar ligadas	☐ Formalmente ligadas; revistas e postas em prática	☐ Ligação com "Balanced Scorecard", inclui parceiros

Sobre alinhamento (continuação)

A10	Acordos de nível de serviço	☐ Usados esporadicamente	☐ Com unidades de desempenho tecnológico	☐ Com unidades; globalizando-se na organização	☐ Global na organização	☐ Incluem parceiros
A11	Benchmarking	☐ Raramente ou nunca usado	☐ Às vezes faz-se benchmarking informal	☐ Pode fazer-se benchmarking formal, é raro atuar	☐ É rotina fazer-se benchmarking, usualmente age-se	☐ É rotina fazer-se benchmarking, agir-se e medir-se os resultados
A12	Avaliação formal dos investimentos em TI	☐ Sem avaliação	☐ Apenas quando há problemas	☐ É uma ocorrência frequente	☐ Ocorrência frequente e acção sobre as suas conclusões	☐ Ocorrência frequente e acção e medição dos resultados
A13	Práticas de melhoria contínua	☐ Nenhuma	☐ Poucas; a eficácia não é medida	☐ Poucas; a eficácia começa a ser medida	☐ Muitas; é frequente a medição da eficácia	☐ As práticas e sua medição estão bem implantadas

Governação

A14	Planeamento formal da estratégia do negócio	☐ Por fazer, ou feito quando é preciso	☐ Ao nível do departamento, pouco contributo da equipa das TI	☐ Algum contributo das TI e com planeamento interdepartamental	☐ Ao nível da unidade de negócio e da empresa e com a equipa das TI	☐ Com a equipa das TI e também com os parceiros
A15	Planeamento formal da estratégia das TI	☐ Por fazer, ou feito quando é preciso	☐ Ao nível do departamento, pouco do negócio	☐ Algum contributo do negócio e planeamento inter-departamental	☐ Ao nível da unidade e da empresa e com a equipa do negócio	☐ Também com os parceiros
A16	Estrutura Organizacional	☐ Centralizada ou descentralizada	☐ Centralizada/descentralizada; alguma colocação	☐ Centralizada/descentralizada ou federal	☐ Federal	☐ Federal
A17	Relações de dependência	☐ O CIO depende do CFO	☐ O CIO depende do CFO	☐ O CIO depende do COO	☐ O CIO depende do COO ou CEO	☐ O CIO depende do CEO
A18	Forma de orçamentar as TI	☐ Centro de custo, o gasto é imprevisível	☐ Centro de custo por unidade	☐ Alguns projetos são tratados como investimentos	☐ As TI são tratadas como investimento	☐ Centro de Lucro

Sobre alinhamento (continuação)

A19	Justificação para os gastos com as TI	☐ Redução de custos	☐ Produtividade, eficiência	☐ Também como facilitador de processos	☐ Condutor de Processos, facilitador da estratégia	☐ Como vantagem competitiva, lucro
A20	Direção sénior conjunta das TI	☐ Não há	☐ Encontros informais sempre que necessário	☐ Encontros formais e regulares	☐ Comprovadamente eficazes	☐ Também incluem parceiros externos
A21	Forma de priorizar os projetos	☐ Como reação às necessidades do negócio ou das TI	☐ Atribuído pela equipa das TI	☐ Atribuído pela equipa do negócio	☐ Mutuamente determinado	☐ Ainda inclui as prioridades dos parceiros

Parceiras

A22	Perceção das TI pela equipa do negócio	☐ As TI são vistas como custo ao fazer o negócio	☐ As TI estão-se a tornar uma mais-valia	☐ As TI facilitam o futuro da atividade do negócio	☐ As TI impulsionam o futuro da atividade do negócio	☐ O pessoal das TI é um parceiro do negócio na criação de valor
A23	Papel das TI no planeamento estratégico do negócio	☐ A equipa das TI não tem envolvimento	☐ As TI facilitam os processos de negócio	☐ As TI estimulam os processos de negócio	☐ Facilitam e estimulam fortemente a estratégia do negócio	☐ As TI e o negócio adaptam-se rapidamente à mudança
A24	Partilha de riscos e de recompensas	☐ As TI assumem todos os riscos sem qualquer recompensa	☐ As TI assumem a maioria dos riscos com pouca recompensa	☐ As TI e o negócio começam a partilhar riscos e recompensas	☐ Os riscos e as recompensas são bastante partilhados	☐ Os gestores encorajam o assumir de riscos
A25	Gestão das relações TI-negócio	☐ A relação TI-negócio não é gerida	☐ Gerida numa base ad hoc	☐ Existem processos, mas não são sempre cumpridos	☐ Existem processos e são normalmente cumpridos	☐ Os processos são continuamente melhorados
A26	Estilo de relacionamento e confiança	☐ Conflituoso e com desconfiança	☐ Relacionamento transacional	☐ As TI tornam-se um fornecedor de serviços valorizado	☐ Parceria de longo prazo	☐ Serviços de parceria, fornecedor de confiança
A27	Patrocinador ou campeão na organização	☐ Geralmente nenhum	☐ Normalmente um IT sénior	☐ Patrocinador/ campeão do IT ou do ao nível da unidade	☐ Patrocinador/ campeão do IT ou do ao nível corporativo	☐ O CEO é o patrocinador/ campeão

Sobre alinhamento (continuação)

Âmbito Tecnológico

A28	Sofisticação tecnológica e estratégica dos sistemas primários	☐ Sistema tradicional (ex: contabilidade ou email)	☐ Sistema transacional (ex: ESS, DSS)	☐ Âmbito alargado (ex: facilitador de processos de negócio)	☐ Âmbito redefinido (ex: condutor de processos de negócio)	☐ Âmbito externo; Condutor / facilitador da estratégia de negócio
A29	Articulação e conformidade das normas das TI	☐ Nenhuma ou ad-hoc	☐ Normas de TI adotadas a um nível funcional	☐ Normas ao nível da unidade de negócio; a surgir a nível da empresa	☐ Normas de TI estabelecidas ao nível da empresa	☐ Normas interempresas estabelecidas, envolvendo parceiros externos
A30	Grau da integração arquitetural	☐ Sem integração formal	☐ Tentativas iniciais de integração	☐ Integração por toda a organização	☐ Integração com parceiros	☐ Evolução com os parceiros
A31	Grau da transparência da infraestrutura	☐ Nenhuma	☐ Limitada	☐ Focada nas comunicações	☐ Gestão eficaz da tecnologia emergente	☐ Em toda a infra-estrutura
A32	Grau da flexibilidade da infraestrutura	☐ Nenhuma	☐ Limitada	☐ Focada nas comunicações	☐ Gestão eficaz da tecnologia emergente	☐ Em toda a infra-estrutura

Competências

A33	Ambiente inovador, empreendedor	☐ A inovação e o empreendedorismo são desencorajados	☐ Ambiente relativamente incentivado ao nível da unidade de negócio	☐ Muito incentivado ao nível da unidade de negócio	☐ Incentivado também ao nível corporativo	☐ Também envolve os parceiros
A34	Quem toma as principais decisões de RH das TI	☐ A gestão de topo do negócio e das TI ao nível corporativo	☐ Idem, com certa influência funcional	☐ A gestão de topo e da unidade; com conselhos das TI	☐ A gestão de topo e das TI em toda a empresa	☐ A gestão de topo em toda a empresa com os parceiros
A35	Disponibilidade para a mudança	☐ Tendência para resistir à mudança	☐ Despontam programas de disponibilidade para a mudança	☐ Programas implementados ao nível funcional	☐ Programas implementados ao nível corporativo	☐ Também com pro-atividade e antecipação da mudança
A36	Mudanças de funções	☐ As mudanças de cargos são raras	☐ As mudanças ocorrem esporadicamente na unidade de negócio	☐ As mudanças ocorrem regularmente na unidade de negócio	☐ As mudanças ocorrem regularmente em todos os níveis da unidade	☐ As mudanças ocorrem também ao nível corporativo

Sobre alinhamento (continuação)

A37	Formação interfuncional e rotação de funções	☐ Não existem oportunidades	☐ Decidido isoladamente em cada unidade de negócio	☐ Ocorrem programas formais em todas as unidades	☐ Ocorrem por toda a empresa	☐ Envolvem também os parceiros
A38	Interação social entre a equipa do negócio e das TI	☐ Mínima interação social entre equipas do negócio e TI	☐ Relação exclusivamente profissional	☐ Começa a haver confiança entre as equipas	☐ Existe mesmo uma efetiva confiança entre as equipas	☐ A interação social é alargada a clientes e parceiros
A39	Atração e retenção de talento	☐ Sem nenhum programa de retenção; Recrutamento mal feito	☐ Recrutamento nas TI baseado em competências técnicas	☐ Recrutamento baseado em competências tecnológicas e de negócio; Programa de retenção	☐ Programa formal para contratação e retenção	☐ Programa eficaz de contratação e retenção

Appendix 4: Portuguese version of the instrument used at pilot test

Sobre incentivos

	(SI1) **Remuneração**	1 Discordo Profun-damente	2 Discordo	3	4 Concordo	5 Concordo Profun-damente
I01	Eu recebo um bom salário-base se o compararmos com o de outros com um trabalho semelhante em outras empresas	☐	☐	☐	☐	☐
I02	A minha empresa dá-me uma remuneração extra pela flexibilidade do meu horário de trabalho ou pelo meu mérito	☐	☐	☐	☐	☐
I03	A remuneração adicional que posso ganhar se exceder os meus objetivos satisfaz-me	☐	☐	☐	☐	☐
	Benefícios Retributivos Adicionais					
I04	Estou satisfeito com o carro e benefícios relacionados com o carro proporcionados pela minha empresa	☐	☐	☐	☐	☐
I05	A minha empresa oferece planos ou seguros de saúde que garantem as minhas necessidades	☐	☐	☐	☐	☐
I06	A minha empresa oferece-me um plano de poupança reforma complementar que me agrada	☐	☐	☐	☐	☐
I29	Em situações especiais, como quando fico doente, é usual a minha empresa não me descontar e pagar-me o tempo que não trabalho	☐	☐	☐	☐	☐
I30	Estou satisfeito com benefícios pessoais, como cartão de crédito, bilhetes de eventos, vouchers, uso de telemóvel ou computador	☐	☐	☐	☐	☐
	Desempenho e Reconhecimento					
I07	Eu entendo os critérios utilizados na avaliação do meu desempenho	☐	☐	☐	☐	☐
I08	Participo regularmente na tomada de decisão na empresa e no sistema de gestão de desempenho	☐	☐	☐	☐	☐
I09	Eu gosto muito de desempenhar a minha atividade	☐	☐	☐	☐	☐
I10	Os objetivos que me são atribuídos têm o seu âmbito e prazo explícitos	☐	☐	☐	☐	☐
I11	A minha empresa reconhece o contributo que eu ou a minha equipa dá	☐	☐	☐	☐	☐
I31	Os meus objetivos são desafiadores, mas também realistas de alcançar, no período definido	☐	☐	☐	☐	☐

	Vida profissional e familiar	1 Discordo Profun-damente	2	3	4	5 Concordo Profun-damente
I12	A minha organização dá-me a possibilidade de fazer as coisas como quero	☐	☐	☐	☐	☐
I13	Eu posso conciliar o meu horário de trabalho para atender às minhas necessidades pessoais e/ou familiares	☐	☐	☐	☐	☐
I14	É fácil para mim conseguir uma folga para compromissos pessoais e emergências	☐	☐	☐	☐	☐
I15	O meu local de trabalho oferece serviços de saúde ou de bem-estar, como ações de prevenção de saúde, ginásio ou iniciativas divertidas	☐	☐	☐	☐	☐
I16	Tenho orgulho em trabalhar na minha empresa porque o meu trabalho e a minha empresa ajudam a tornar o mundo melhor	☐	☐	☐	☐	☐
I17	As minhas funções permitem-me experimentar uma carreira em que eu posso estar comprometido e dedicado a uma causa importante	☐	☐	☐	☐	☐
I18	A minha empresa ajuda os funcionários a cuidar dos seus filhos e dependentes	☐	☐	☐	☐	☐
I19	A minha empresa oferece apoio financeiro para satisfazer as minhas necessidades familiares, como as de educação	☐	☐	☐	☐	☐
I20	O meu trabalho tem facilidades que ajudam o meu bem-estar, tais como estacionamento, cantina ou espaços interativos	☐	☐	☐	☐	☐
I21	A minha empresa valoriza o trabalho em equipa e a diversidade	☐	☐	☐	☐	☐
I22	Os gestores seniores ouvem-me e valorizam as minhas ideias	☐	☐	☐	☐	☐
I23	O meu cargo atual permite-me manter na minha área de especialização ao longo da minha carreira	☐	☐	☐	☐	☐
I24	A minha empresa permite-me aceder aos dados e aos recursos tecnológicos necessários para fazer bem o meu trabalho	☐	☐	☐	☐	☐
	Desenvolvimento e Oportunidades de carreira					
I25	A minha empresa proporciona-me oportunidades para aumentar os meus conhecimentos e as minhas competências	☐	☐	☐	☐	☐
I26	Posso trabalhar com especialistas e pessoas experientes que representam modelos a seguir e me inspiram no meu trabalho	☐	☐	☐	☐	☐
I27	O meu cargo atual permite-me desenvolver uma carreira que possibilita continuar a seguir os meus objetivos pessoais	☐	☐	☐	☐	☐
I28	O meu cargo atual permite-me ser constantemente desafiado com problemas difíceis ou situações de competição	☐	☐	☐	☐	☐

Sobre alinhamento

	Comunicação	1 Sem ou fraco processo (sem alinhamento)	2 Processo principiante	3 Processo definido	4 Processo melhorado	5 Processo otimizado (alinhamento completo)
A01	Entendimento do negócio pela equipa das TI	☐ Sem entendimento do negócio pelos gestores das TI	☐ Entendimento limitado do negócio pelos gestores das TI	☐ Bom entendimento do negócio pelos gestores das TI	☐ O entendimento do negócio é encorajado na equipa das TI	☐ O entendimento do negócio é exigido a toda a equipa das TI
A02	Entendimento das TI pela equipa do negócio	☐ Os gestores do negócio sem entendimento das TI	☐ Os gestores do negócio têm uma visão limitada das TI	☐ Os gestores do negócio têm bom entendimento das TI	☐ É encorajado o entendimento das TI na equipa do negócio	☐ O entendimento das TI é exigido a toda a equipa do negócio
A03	Aprendizagem organizacional	☐ Apenas em conversas e reuniões fortuitas	☐ Através de newsletters, relatórios, emails de grupo	☐ Através de formação e reuniões departamentais	☐ Com métodos formais patrocinados por gestor sénior	☐ Com estratégia organizacional monitorizada em comités inter departamentais
A04	Estilo e facilidade na comunicação	☐ Apenas do negócio para a equipa das TI; formal	☐ De sentido único, um pouco informal	☐ A comunicação é feita nos dois sentidos, formal	☐ Nos dois sentidos, formal e por vezes também um pouco informal	☐ Nos dois sentidos, informal e flexível como complemento ao formal
A05	Contributo no desenvolvimento de ativos intelectuais	☐ Ad hoc	☐ Alguma partilha estruturada a emergir	☐ Contributo estruturado em torno de processos-chave	☐ Partilha formal em todos os níveis hierárquicos	☐ Partilha formal também com parceiros
A06	Pessoal de ligação das equipas TI-negócio	☐ Nenhuma ligação é promovida ou somente quando necessário	☐ Faculta uma ligação TI-Negócio preliminar	☐ Facilita a transferência de conhecimento	☐ Facilita a construção de relacionamentos	☐ Constrói também relacionamentos com parceiros

Medição de Valor das TI

A07	Métricas das TI usadas na gestão das TI	☐ Apenas métricas técnicas	☐ Com custo técnico; métricas raramente revistas	☐ Com revisões, atuação sobre métricas técnicas e ROI	☐ Também se mede a eficácia	☐ Medem-se também opções no negócio, RH e de parceiros
A08	Métricas das TI usadas na gestão do negócio	☐ É rara a medição do investimento em tecnologias de informação	☐ A medição é por custo unitário; raramente revista	☐ Com revisões, ação com base no ROI e no custo	☐ Também se mede o valor para o cliente	☐ Uso do 'Balanced Scorecard', inclui o valor para os parceiros

Sobre alinhamento (continuação)

A09	Ligação das métricas das TI e do negócio	☐ O valor dos investimentos em TI raramente é medido	☐ As métricas do negócio e das TI não estão ligadas	☐ As métricas do negócio e das TI começam a estar ligadas	☐ Formalmente ligadas; revistas e postas em prática	☐ Ligação com "Balanced Scorecard", inclui parceiros
A10	Acordos sobre o nível de serviço em TI	☐ Usados esporadicamente	☐ Com algumas métricas para medição do desempenho tecnológico	☐ Com unidades de medida; generalizando-se na organização	☐ Os acordos estão generalizados por toda a organização	☐ Os acordos também incluem parceiros
A11	Benchmarking	☐ Raramente ou nunca usado	☐ Às vezes faz-se benchmarking informal	☐ Pode fazer-se benchmarking formal, é raro atuar	☐ É rotina fazer-se benchmarking, usualmente age-se	☐ É rotina fazer-se benchmarking, agir-se e medir-se os resultados
A12	Avaliação formal dos investimentos em TI	☐ Sem avaliação	☐ Apenas quando há problemas	☐ É frequente	☐ É frequente; Há ação após as suas conclusões	☐ É usual medir os resultados com avaliação pós-projeto; Há ação posterior
A13	Práticas de melhoria contínua	☐ Nenhuma prática; sem medidas	☐ Poucas; a eficácia não é medida	☐ Poucas; a eficácia começa a ser medida	☐ Muitas; é frequente a medição da eficácia	☐ As práticas e sua medição estão bem implantadas

Governação

A14	Planeamento formal da estratégia do negócio	☐ Planeamento por fazer, ou feito quando é preciso	☐ Ao nível do departamento, pouco contributo da equipa das TI	☐ Algum contributo das TI e com planeamento interdepartamental	☐ Ao nível da unidade de negócio e da empresa e com a equipa das TI	☐ Com a equipa das TI e também com os parceiros
A15	Planeamento formal da estratégia das TI	☐ Planeamento por fazer, ou feito quando é preciso	☐ Ao nível do departamento, pouco envolvimento do negócio	☐ Algum contributo do negócio e planeamento interdepartamental	☐ Ao nível organizacional, em comité estratégico com CEO, negócio e TI	☐ Também com os parceiros
A16	Estrutura Organizacional das TI	☐ Estrutura completamente centralizada ou descentralizada	☐ Essencialmente centralizada ou descentralizada; pouca partilha de decisão	☐ Estrutura que conjuga a centralização e descentralização; princípio federal	☐ Estrutura federal; Sinergias e autonomia bastante alcançadas	☐ Coordenação, sinergias e autonomia excecionais; Princípio da subsidiariedade;

Sobre alinhamento (continuação)

A17	Relações de dependência do responsável das TI	☐ A área das TI não tem um CIO ou responsável equivalente	☐ O CIO (Diretor de Informática) depende do CFO (diretor financeiro)	☐ O CIO depende do COO (Diretor de Operações)	☐ O CIO depende do responsável da unidade de negócio	☐ O CIO depende do CEO, do Chairman ou do Presidente
A18	Forma de orçamentar as TI	☐ É um centro de custo, o gasto é imprevisível	☐ É um centro de custo em cada unidade de negócio	☐ Alguns projetos são tratados como investimentos	☐ As TI são tratadas como investimento	☐ Centro de lucro; Inclui eficiência dos processos, valor p/ parceiros e inovação
A19	Justificação para os gastos com as TI	☐ Redução de custos	☐ Produtividade, eficiência	☐ Também como facilitador de processos	☐ Condutor de Processos, facilitador da estratégia	☐ Como vantagem competitiva, lucro
A20	Comité coordenador sénior conjunto das TI	☐ Não há coordenação conjunta das TI com o negócio	☐ Há encontros informais sempre que necessário	☐ Há encontros formais e regulares de comité com, negócio e TI	☐ A coordenação é eficaz; Inclui o CFO e usualmente o CEO	☐ Também inclui parceiros externos
A21	Forma de priorizar os projetos	☐ Como reação às necessidades do negócio ou das TI	☐ Atribuído pela equipa das TI	☐ Atribuído pela equipa do negócio	☐ Mutuamente determinado pela equipa do negócio e das TI	☐ Considera ainda as prioridades dos parceiros

Parceria entre a equipa do negócio e das TI

A22	Papel das TI segundo a equipa do negócio	☐ As TI são vistas como custo ao fazer o negócio	☐ As TI estão-se a tornar uma mais-valia	☐ As TI facilitam o futuro da atividade do negócio	☐ As TI impulsionam o futuro da atividade do negócio	☐ O pessoal das TI é um parceiro do negócio na criação de valor
A23	Papel das TI no planeamento estratégico do negócio	☐ A equipa das TI não tem envolvimento	☐ As TI facilitam os processos de negócio	☐ As TI estimulam os processos de negócio	☐ Facilitam e estimulam fortemente a estratégia do negócio	☐ As TI e o negócio adaptam-se rapidamente à mudança
A24	Cultura de partilha de riscos e de recompensas nos projetos de TI	☐ A equipa das TI assume todos os riscos, sem qualquer recompensa	☐ A equipa das TI assume a maioria dos riscos com pouca recompensa	☐ As equipas das TI e do negócio começam a partilhar riscos e recompensas	☐ Os riscos e as recompensas são bastante partilhados	☐ Enorme cultura de partilha de riscos; Os gestores encorajados no assumir de riscos
A25	Gestão das relações entre as equipas das TI e do negócio	☐ A relação entre as equipas das TI e do negócio não é gerida	☐ Gerida numa base ad hoc	☐ Existem processos, mas não são sempre cumpridos	☐ Existem processos e são normalmente cumpridos	☐ Os processos são continuamente melhorados

Sobre alinhamento (continuação)

Âmbito Tecnológico

A26	Estilo de relacionamento e confiança	☐ Conflituoso e com desconfiança	☐ Relacionamento transacional	☐ As TI tornam-se um fornecedor de serviços valorizado	☐ Parceria de longo prazo	☐ Serviços de parceria, fornecedor de confiança
A27	Patrocinador ou patrono da área das TI na organização	☐ Geralmente não há nenhum patrocinador ou patrono das TI	☐ Normalmente é um gestor sénior das TI que defende as TI	☐ Patrocinador/ patrono comum para o negócio e TI ao nível da unidade	☐ Patrocinador/ patrono comum para o negócio e TI ao nível corporativo	☐ O CEO é o patrocinador/ patrono comum para o negócio e TI
A28	Sofisticação tecnológica e estratégica dos sistemas primários	☐ Sistema tradicional (ex: contabilidade ou gestor de email)	☐ Sistema transacional (ex: *Executive Support System*)	☐ Âmbito alargado (ex: facilitador de processos de negócio)	☐ Âmbito redefinido (ex: impulsionador de processos de negócio)	☐ Âmbito externo; impulsionador / facilitador da estratégia de negócio
A29	Articulação e conformidade das normas das TI	☐ Nenhuma ou ad-hoc	☐ Normas de TI adotadas a um nível funcional; Exemplos: ISO, COBIT, ITIL, TOGAF, SOX	☐ Normas ao nível da unidade de negócio; a surgir a nível da empresa	☐ Normas de TI estabelecidas ao nível da empresa	☐ Normas interempresas estabelecidas, envolvendo parceiros externos
A30	Grau da integração arquitetural	☐ Sem integração formal	☐ Tentativas iniciais de integração	☐ Integração por toda a organização	☐ Integração com parceiros	☐ Evolução com os parceiros
A31	Grau da transparência da infraestrutura	☐ Nenhuma	☐ Limitada	☐ Focada nas comunicações	☐ Gestão eficaz da tecnologia emergente	☐ Em toda a infraestrutura
A32	Grau da flexibilidade da infraestrutura	☐ Nenhuma	☐ Limitada	☐ Focada nas comunicações	☐ Gestão eficaz da tecnologia emergente	☐ Em toda a infraestrutura

Competências

A33	Ambiente inovador, empreendedor	☐ A inovação e o empreendedorismo são desencorajados	☐ Ambiente relativamente incentivado ao nível da unidade de negócio	☐ Muito incentivado ao nível da unidade de negócio	☐ Incentivado também ao nível corporativo	☐ Também envolve os parceiros
A34	Quem toma as principais decisões de RH das TI	☐ A gestão de topo do negócio e das TI ao nível corporativo	☐ Idem, com certa influência funcional	☐ A gestão de topo e da unidade; com conselhos das TI	☐ A gestão de topo e das TI em toda a empresa	☐ A gestão de topo em toda a empresa com os parceiros

Sobre alinhamento (continuação)

A35	Disponibilidade para a mudança	☐ Tendência para resistir à mudança	☐ Despontam programas de disponibilidade para a mudança	☐ Programas implementados ao nível funcional	☐ Programas implementados ao nível corporativo	☐ Também com pro-atividade e antecipação da mudança
A36	Migração entre carreiras do negócio e das TI	☐ A migração entre carreiras é rara	☐ A migração ocorre esporadicamente na unidade de negócio	☐ A migração ocorre regularmente na unidade de negócio	☐ A migração ocorre regularmente em todos os níveis da unidade	☐ A migração ocorre também ao nível corporativo
A37	Formação interfuncional e rotação de funções	☐ Não existem oportunidades	☐ Decidido isoladamente em cada unidade de negócio	☐ Ocorrem programas formais em todas as unidades	☐ Ocorrem por toda a empresa	☐ Envolvem também os parceiros
A38	Interação social entre a equipa do negócio e das TI	☐ Mínima interação social entre equipas do negócio e TI	☐ Relação exclusivamente profissional	☐ Começa a haver confiança entre as equipas	☐ Existe mesmo uma efetiva confiança entre as equipas	☐ A interação social é alargada a clientes e parceiros
A39	Atração e retenção de talento	☐ Sem nenhum programa de retenção; Recrutamento mal feito	☐ Recrutamento nas TI baseado em competências técnicas	☐ Recrutamento baseado em competências tecnológicas e de negócio; Programa de retenção	☐ Programa formal para contratação e retenção	☐ Programa eficaz de contratação e retenção

Observation: The underlined words represent new or changed wording.

Appendix 5: English version of complete instrument used at final test

Welcome message

My name is Fernando Belfo and I am a teacher in a higher education institution and researcher in the field of technology and information systems. My professional and academic career can be found in my personal page (click here if you want to see it).

I prepared this questionnaire as part of a research in the context of my PhD at the University of Minho, which addresses one of the issues that most concern the managers of information technology (IT): the alignment between business and IT. This alignment is seen as the measure of how much the mission, objectives and plans of the IT in an organization support and is supported by the mission, objectives and plans of the business.

The concern of these managers with the alignment, is justified by the conviction, already demonstrated in previous studies, that its improvement will positively influence the business performance. My research aims a better understanding about the influence that various types of incentives given to managers of a medium or large Portuguese company has on the alignment between business and IT.

I ask you some minutes of your time to answer the questions in this survey, which, after a few brief questions about yourself and your company, will ask you about these two issues. First, it will ask you about various incentives that have (or have not) in your company and, secondly, you understanding about the level of business and IT alignment in your organization. Your answers are very important to complete this study.

Fernando Paulo Belfo

About you

Gender (M01)

☐ Female (01)
☐ Male (02)

Age (M02)

☐ Born after 1981 (less than 34 years old) (01)

☐ Born from 1966 to 1980 (from 35 to 49 years old) (02)

☐ Born from 1946 to 1965 (from 50 to 69 years old) (03)

☐ Born before 1946 (more than 69 years old) (04)

Function performed in the company (M03)

(free text)

_____

About your firm

Company economic activity (M04)

☐ Agriculture, livestock, hunting, forestry and fishing (01)

☐ Extractive industries (02)

☐ Manufacturing industries (03)

☐ Electricity, gas, steam and water (04)

☐ Construction (05)

☐ Trade (wholesale and retail); vehicle repair (06)

☐ Transportation and storage (07)

☐ Accommodation, catering and similar activities (08)

☐ Information and communication activities (09)

☐ Financial and insurance activities (10)

☐ Real estate activities (11)

☐ Consulting, technical and other similar activities (12)

☐ Administrative activities and support services (13)

☐ Education, health and other service activities (14)

☐ _____ (M04 other)

Company size **(M05)**

☐ micro (1-9 employees and turnover <= €2 million or balance sheet <= €2 million) (01)

☐ small (10-49 employees and turnover <= €10 million or balance sheet <= €10 million) (02)

☐ medium (50-249 employees and turnover <= 50 m or balance sheet <= €43 m) (03)

☐ large A (250-999 employees and turnover > 50 million or balance sheet > €43 million) (04)

☐ large B (1000-4999 employees and turnover > 50 million or balance sheet > €43 million) (05)

☐ large C (>= 5000 employees and turnover > 50 million or balance sheet > €43 million) (06)

About incentives

Compensation	1 strongly disagree	2	3	4	5 strongly agree
I01 I receive a good base wage when compared with others doing similar work at other companies	☐	☐	☐	☐	☐
I02 My company offers me an extra compensation for my flexible working or the merit of my work	☐	☐	☐	☐	☐
I03 The additional compensation which I may earn if I exceed my objectives satisfies me	☐	☐	☐	☐	☐

Benefits	1 strongly disagree	2	3	4	5 strongly agree
I04 I'm happy with the car and related benefits provided by my company	☐	☐	☐	☐	☐
I05 My company offers health plans or insurances to ensure my needs	☐	☐	☐	☐	☐
I06 My company offers me a supplementary retirement savings plan that I like	☐	☐	☐	☐	☐

Performance & Recognition	1 strongly disagree	2	3	4	5 strongly agree
I07 I understand the criteria used to evaluate my performance"	☐	☐	☐	☐	☐
I08 I regularly participate in the company's decision making and on the performance management system	☐	☐	☐	☐	☐
I09 I enjoy doing my activity very much	☐	☐	☐	☐	☐
I10 The goals assigned to me have their scope and period explicit	☐	☐	☐	☐	☐
I11 My company recognizes the contribution that I or my team gives	☐	☐	☐	☐	☐

About incentives (continuation)

Work-life	1 strongly disagree	2	3	4	5 strongly agree
I12 My organization permits me to experience the chance to do things my own way	☐	☐	☐	☐	☐
I13 I can conciliate my work schedule to meet my personal and/or family needs	☐	☐	☐	☐	☐
I14 It is easy for me to get time off because of personal commitments and emergencies	☐	☐	☐	☐	☐
I15 My workplace offers health or wellness services, like health prevention initiatives, on-site fitness facilities or funny initiatives	☐	☐	☐	☐	☐
I16 I am proud to be working at my company because my work and my company makes the world a better place	☐	☐	☐	☐	☐
I17 My job function permits me to experience a career in which I can be committed and devoted to an important cause	☐	☐	☐	☐	☐
I18 My company helps employees caring for their child and dependents	☐	☐	☐	☐	☐
I19 My company offers financial support to meet my family needs, like education ones	☐	☐	☐	☐	☐
I20 In my work I have facilities such as parking, canteen or interactive spaces that help my welfare	☐	☐	☐	☐	☐
I21 My company values teamwork and diversity	☐	☐	☐	☐	☐
I22 Senior managers listen to me and care about my ideas	☐	☐	☐	☐	☐
I23 My current position permits me to remain in my area of expertise throughout my career	☐	☐	☐	☐	☐
I24 My company provides me with the necessary data and technological resources to do my job well	☐	☐	☐	☐	☐
Development & Career opportunities	1 strongly disagree	2	3	4	5 strongly agree
I25 My work allows me with opportunities for increasing my knowledge and skills	☐	☐	☐	☐	☐
I26 I have the opportunity to work with experts and experienced people who represent role models and inspire me in my work	☐	☐	☐	☐	☐
I27 My current position permits me to develop a career that permits to continue to pursue my individual objectives	☐	☐	☐	☐	☐
I28 My current position permits me to being constantly challenged by tough problems or competitive situations"	☐	☐	☐	☐	☐

About alignment

Communications	1 No/poor process (no alignment)	2 Beginning process	3 Establishing process	4 Improved process	5 Optimal process (complete alignment)
A01 Understanding of business by IT team	☐ IT managers lack business understanding	☐ limited business understanding by IT managers	☐ good business understanding by IT managers	☐ business understanding encouraged among IT staff	☐ business understanding required of all IT staff
A02 Understanding of IT by business team	☐ business managers lack IT understanding	☐ limited IT understanding by business managers	☐ good IT understanding by business managers	☐ IT understanding encouraged among staff	☐ IT understanding required of all staff
A03 Organizational learning	☐ Casual conversation and meetings	☐ Newsletters, reports, group e-mail	☐ Training, departmental meetings	☐ Formal methods sponsored by senior	☐ With organizational strategy monitored at interdepartmental committees
A04 Style and ease of access	☐ Only communication from Business to IT; formal	☐ One-way communication, somewhat informal	☐ Two-way communication, formal	☐ Two-way, somewhat informal in addition to formal	☐ Two-way, also informal and flexible as a complement to formal
A05 Leveraging intellectual assets	☐ Ad hoc	☐ Some structured sharing emerging	☐ Structured around key processes	☐ Formal sharing at all levels	☐ Formal sharing with partners
A06 IT–business liaison staff	☐ None or use only as needed	☐ Primary IT–Business link	☐ Facilitate knowledge transfer	☐ Facilitate relationship building	☐ Building relationship with partners
Competency/Value measurements					
A07 IT metrics at IT management	☐ Technical only	☐ Technical cost; metrics rarely reviewed	☐ Review, act on technical, ROI metrics	☐ Also measure effectiveness	☐ Also measure business ops, HR, partners
A08 IT metrics at Business metrics	☐ IT investments measured rarely, if ever	☐ Cost/unit; rarely reviewed	☐ Review, act on ROI, cost	☐ Also measure customer value	☐ Balanced scorecard, includes partners
A09 Link between IT and business metrics	☐ Value of IT investments rarely measured	☐ Business, IT metrics not linked	☐ Business, IT metrics becoming linked	☐ Formally linked; reviewed and acted upon	☐ Balanced scorecard, includes partners
A10 Service level agreements	☐ Used sporadically	☐ With some metrics for technology performance measurement	☐ With metrics; becoming enterprise wide	☐ The agreements are widespread across entire enterprise	☐ Agreements also include partners

About alignment (continuation)

Competency/Value measurements

A11	Benchmarking	☐ Seldom or never	☐ Sometimes benchmark informally	☐ May benchmark formally, seldom act	☐ Routinely benchmark, usually act	☐ Routinely benchmark, act on, and measure results
A12	Formally assess IT investments	☐ Do not assess	☐ Only when there is a problem	☐ Becoming a routine occurrence	☐ Routinely assess and act on findings	☐ Routinely assess, act on, and measure results
A13	Continuous improvement practices	☐ None	☐ Few; effectiveness not measured	☐ Few; starting to measure effectiveness	☐ Many; frequently measure effectiveness	☐ Practices and measures well-established

Governance

A14	Formal business strategy planning	☐ Not done, or done as needed	☐ At unit functional level, slight IT input	☐ Some IT input and cross-functional planning	☐ At unit and enterprise, with IT	☐ With IT and partners
A15	Formal IT strategy planning	☐ The planning is not done, or done as needed	☐ At unit functional level, light business input	☐ Some business input and cross-functional planning	☐ At organizational level, in strategic committee with CEO, business and IT	☐ With partners
A16	Organizational structure of IT	☐ Completely centralized or decentralized structure	☐ The structure is mostly centralized /decentralized; scarce decision sharing	☐ Balancing a centralized and decentralized structure; Federal principle	☐ The structure is federal; synergies and autonomy are considerably met	☐ Exceptional coordination, synergy and autonomy; Subsidiary principle
A17	Reporting relationships of the IT responsible	☐ The IT area does not have a CIO or equivalent in charge	☐ CIO (Chief Information Officer) reports to CFO (Chief Financial Officer)	☐ CIO reposts to COO (Chief Operating Officer)	☐ CIO reports to the one in charge of the business unit	☐ CIO reports to CEO, Chairman or President
A18	How IT is budgeted	☐ IT is a cost center, spending is unpredictable	☐ IT is a cost center by business unit	☐ Some projects are treated as investments	☐ IT projects are always treated as investment	☐ Profit center; Includes partners value, processes efficiency or innovation
A19	Rationale for IT spending	☐ Reduce costs	☐ Productivity, efficiency	☐ Also a process enabler	☐ Process driver, strategy enabler	☐ Competitive advantage, profit

About alignment (continuation)

Governance

A20	Senior-level IT steering committee	☐ Do not have	☐ Meet informally as needed	☐ Formal committees meet regularly	☐ Proven to be effective	☐ Also includes external partners
A21	How projects are prioritized	☐ React to business or IT need	☐ Determined by IT function	☐ Determined by business function	☐ Mutually determined	☐ Partners' priorities are considered

Partnership

A22	Business perception of IT	☐ Cost of doing business	☐ Becoming an asset	☐ Enables future business activity	☐ Drives future business activity	☐ Partner with business in creating value
A23	IT's role in strategic business planning	☐ Not involved	☐ Enables business processes	☐ Drives business processes	☐ Enables or drives business strategy	☐ IT, business adapt quickly to change
A24	Culture of shared risks and rewards on IT projects	☐ The IT team takes all the risks and receives no rewards	☐ The IT team takes most risks with little reward	☐ The IT and business teams start sharing risks, rewards	☐ Risks, rewards always shared	☐ Huge culture of risk-sharing; Managers encouraged to take risks
A25	Managing the IT–business relationship	☐ IT–business relationship is not managed	☐ Managed on an ad hoc basis	☐ Processes exist but not always followed	☐ Processes exist and complied with	☐ Processes are continuously improved
A26	Relationship/trust style	☐ Conflict and mistrust	☐ Transactional relationship	☐ IT becoming a valued service provider	☐ Long-term partnership	☐ Partner, trusted vendor or IT services
A27	Business sponsors/ champions of the IT scope	☐ Usually there is none sponsors/ champions of the IT	☐ Often have a senior IT sponsor or champion	☐ Common IT and business sponsor or champion at unit level	☐ Common business sponsor or champion at corporate level	☐ CEO is the sponsor or champion for both the business and the IT

Technology scope

A28	Technological and strategic sophistication of primary systems	☐ Traditional (e.g., accounting, email)	☐ Transaction (e.g., ESS, DSS)	☐ Expanded scope (e.g., business process enabler)	☐ Redefined scope (business process driver)	☐ External scope; Business strategy driver/enabler
A29	IT standards articulation and compliance	☐ None or ad-hoc	☐ Standards defined	☐ Emerging enterprise standards	☐ Enterprise standards	☐ Inter-enterprise standards
A30	Degree of architectural integration	☐ No formal integration	☐ Early attempts at integration	☐ Integrated across the organization	☐ Integrated with partners	☐ Evolved with partners

About alignment (continuation)

Technology scope

A31	Degree of infrastructure transparency	☐ None	☐ Limited	☐ Focused on communications	☐ Effective emerging technology management	☐ Across the infrastructure
A32	Degree of infrastructure flexibility	☐ None	☐ Limited	☐ Focused on communications	☐ Effective emerging technology management	☐ Across the infrastructure

Skills

A33	Innovative, entrepreneurial environment	☐ Discouraged	☐ Somewhat encouraged at unit level	☐ Strongly encouraged at unit level	☐ Also at corporate level	☐ Also with partners
A34	Key IT HR decisions made by:	☐ Top business and IT management at corporate	☐ Same, with emerging functional influence	☐ Top business and unit management; IT advises	☐ Top business and IT management across firm	☐ Top management across firm and partners
A35	Change readiness	☐ Tend to resist change	☐ Change readiness programs emerging	☐ Programs in place at functional level	☐ Programs in place at corporate level	☐ Also proactive and anticipate change
A36	Career crossover opportunities	☐ Job transfers rarely occur	☐ Occasionally occur within unit	☐ Regularly occur for unit management	☐ Regularly occur at all unit levels	☐ Also at corporate level
A37	Cross-functional training and job rotation	☐ No opportunities	☐ Decided by units	☐ Formal programs run by all units	☐ Also across enterprise	☐ Also with partners
A38	Social interaction	☐ Minimal IT–business interaction	☐ Strictly a business-only relationship	☐ Trust and confidence is starting	☐ Trust and confidence achieved	☐ Attained with customers and partners
A39	Attract and retain top talent	☐ No retention program; poor recruiting	☐ IT hiring focused on technical skills	☐ Technology and business focus; retention program	☐ Formal program for hiring and retaining	☐ Effective program for hiring and retaining

Appendix 6: Content validity ratio (CVR) computation

#	Date	Average	I01	I02	I03	I04	I05	I06	I07	I08	I09	I10	I11	I12	I13	I14	I15	I16	I17	I18	I19	I20	I21	I22	I23	I24	I25	I26	I27	I28
1	12-03-2014	2,94	3	3	3	2	3	3	3	3	3	3	3	2	3	3	3	2	2	3	3	3	3	3	3	3	3	3	3	3
2	17-03-2014	2,99	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3	17-03-2014	2,87	2	2	3	3	3	2	3	3	3	2	3	2	3	2	3	2	2	3	3	3	3	3	3	3	3	3	2	3
4	18-03-2014	2,72	3	3	3	2	2	2	3	3	3	3	3	1	3	2	1	3	3	1	2	1	3	3	3	3	3	1	3	3
5	16-04-2014	2,79	3	2	2	3	3	3	3	2	3	3	3	2	2	3	2	2	2	3	2	2	3	3	3	3	3	3	2	2
6	21-04-2014	2,85	3	2	3	3	2	1	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3
7	17-05-2014	2,88	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	3	3	3	2
8	19-05-2014	2,97	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3
9	21-05-2014	2,48	2	3	3	3	2	1	3	2	3	3	3	3	3	2	2	2	2	2	2	2	2	3	3	2	3	1	3	3
10	29-05-2014	2,57	3	2	2	3	2	2	3	3	3	3	2	3	3	3	2	2	2	2	2	3	3	3	3	3	2	2	2	2
11	16-07-2014	2,69	2	3	3	2	3	2	3	3	3	3	3	2	3	3	2	3	3	2	2	2	3	3	2	3	3	3	3	3
Average			2,00	2,55	2,82	2,73	2,64	2,27	3,00	2,82	3,00	2,91	2,91	2,27	2,82	2,73	2,45	2,55	2,45	2,55	2,55	2,55	2,91	2,91	2,91	2,82	2,91	2,45	2,64	2,73

#	Date	Average	A01	A02	A03	A04	A05	A06	A07	A08	A09	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	A30	A31	A32	A33	A34	A35	A36	A37	A38	A39
1	12-03-2014	2,94	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2	17-03-2014	2,99	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3	17-03-2014	2,87	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4	18-03-2014	2,72	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	2	3	3	3	2	3	3	3	3	3	3	3
5	16-04-2014	2,79	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3
6	21-04-2014	2,85	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	2	3	3
7	17-05-2014	2,88	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3	3	2	3	3	3	3	3	2	3
8	19-05-2014	2,97	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
9	21-05-2014	2,48	3	2	3	2	3	2	2	3	3	3	2	2	3	3	3	3	3	2	2	3	3	2	3	3	3	2	2	2	2	3	2	2	3	2	3	2	2	2	3
10	29-05-2014	2,57	3	2	3	2	3	2	3	3	3	3	2	2	3	3	3	2	2	2	2	3	3	2	3	3	2	3	2	3	2	3	2	3	3	2	3	3	3	3	3
11	16-07-2014	2,69	3	3	3	3	3	3	2	2	3	3	2	2	3	3	2	3	2	3	2	3	3	3	3	3	3	2	3	2	2	2	3	3	3	3	3	3	3	2	3
Average			3,00	2,82	3,00	2,82	3,00	2,73	2,82	2,91	3,00	3,00	2,73	2,73	3,00	3,00	2,82	2,91	2,73	2,82	2,64	3,00	3,00	2,82	2,91	2,91	2,91	2,82	2,73	2,73	2,73	2,91	2,73	2,73	3,00	2,82	3,00	2,91	2,82	2,73	3,00

Appendix 7: Total Rewards model checklist

Compensation	Benefits
Base Wages	***Legally Required/Mandated***
☐ Salary Pay	☐ Unemployment Insurance
☐ Hourly Pay	☐ Worker's Compensation Insurance
☐ Piece Rate Pay	☐ Social Security Insurance
Premium Pay	☐ Medicare
☐ Shift Differential Pay	☐ State Disability Insurance (if applicable)
☐ Weekend/Holiday Pay	***Health & Welfare***
☐ On-call Pay	☐ Medical Plan
☐ Call-In Pay	☐ Dental Plan
☐ Hazard Pay	☐ Vision Plan
☐ Bi-Lingual Pay	☐ Prescription Drug Plan
☐ Skill-Based Pay	☐ Flexible Spending Accounts (FSAs)
Variable Pay	☐ Health Reimbursement Accounts (HRAs)
☐ Commissions	☐ Health Savings Accounts (HSAs)
☐ Team-Based Pay	☐ Mental Health Plan
Bonus Programs	☐ Life Insurance
☐ Referral Bonus	☐ Spouse/Dependent Life Insurance
☐ Hiring Bonus	☐ AD&D Insurance
☐ Retention Bonus	☐ Short-Term/Long-Term Disability Insurance
☐ Project Completion Bonus	***Retirement***
Incentive Pay	☐ Defined Benefit Plan
Short-term:	☐ Defined Contribution Plan
☐ Profit Sharing	☐ Profit Sharing Plan
☐ Individual Performance Based Incentives	☐ Hybrid Plan
☐ Performance-Sharing Incentives	***Pay for Time Not Worked***
Long-term:	☐ Vacation
☐ Restricted Stock	☐ Holiday
☐ Performance Shares	☐ Sick Leave
☐ Performance Units	☐ Bereavement Leave
☐ Stock Options/Grants	☐ Leaves of Absence (Military, Personal Medical, Family Medical)

Appendix 7: Total Rewards model checklist (continuation)

Work-Life	Work-Life
Workplace Flexibility/ Alternative Work Arrangements	***Caring for Dependents***
☐ Flex-Time	☐ Dependent Care Reimbursement Accounts
☐ Telecommuting	☐ Dependent Care Travel-Related Expense Reimbursements
☐ Alternative Work Sites	☐ Dependent Care Referral and Resource Services
☐ Compressed Workweek	☐ Dependent Care Discount Programs or Vouchers
☐ Job Sharing	☐ Emergency Dependent Care Services
☐ Part-time Employment	☐ Childcare Subsidies
☐ Seasonal Schedules	☐ On-site Caregiver Support Groups
Paid and Unpaid Time Off	☐ On-Site Dependent Care
☐ Maternity/Paternity Leave	☐ Adoption Assistance Services
☐ Adoption Leave	☐ After-School Care Programs
☐ Sabbaticals	☐ College/Scholarship Information
Health and Wellness	☐ Scholarships
☐ Employee Assistance Programs	☐ Privacy Rooms
☐ On-site Fitness Facilities	☐ Summer Camps & Activities
☐ Discounted Fitness Club Rates	☐ Special Needs Childcare
☐ Weight Management Programs	☐ Disabled Adult Care
☐ Smoking Cessation Assistance	☐ Geriatric Counseling
☐ On-Site Massages	☐ In-home Assessments for Eldercare
☐ Stress Management Programs	***Financial Support***
☐ Voluntary Immunization Clinics	☐ Financial Planning Services and Education
☐ Health Screenings	☐ Adoption Reimbursement
☐ Nutritional Counseling	☐ Transit Subsidies
☐ On-Site Nurse	☐ 529 Plans
☐ Business Travel Health Services	☐ Savings Bonds
☐ Disability Management	***Voluntary Benefits***
☐ Return to Work Programs	☐ Long Term Care
☐ Reproductive Health/	☐ Auto/Home Insurance
☐ Pregnancy Programs	☐ Pet Insurance
☐ 24-Hour Nurse Line	☐ Legal Insurance
☐ On-Site Work-Life Seminars (Stress-Reduction, Parenting, etc.)	☐ Identity Theft Insurance
☐ Health Advocate	☐ Employee Discounts
Community Involvement	☐ Concierge Services
☐ Community Volunteer Programs	☐ Parking
☐ Matching Gift Programs	***Culture Change Initiatives***
☐ Shared Leave Programs	☐ Work Redesign
☐ Disaster Relief Funds	☐ Team Effectiveness
☐ Sponsorships/Grants	☐ Diversity/Inclusion Initiatives
☐ In-Kind Donations	☐ Women's Advancement Initiatives
	☐ Work Environment Initiatives
	☐ Multigenerational Initiatives

Appendix 7: Total Rewards model checklist (continuation)

Performance and Recognition	Development and Career Opportunities
Performance ☐ 1:1 Meetings ☐ Performance Reviews ☐ Project Completion/Team Evaluations ☐ Performance Planning/Goal Setting Sessions ***Recognition*** ☐ Service Awards ☐ Retirement Awards ☐ Peer Recognition Awards ☐ Spot Awards ☐ Managerial Recognition Programs ☐ Organization-wide Recognition Programs ☐ Exceeding Performance Awards ☐ Employee of the Month/ Year Awards ☐ Appreciation Luncheons, Outings, Formal Events ☐ Goal-Specific Awards (Quality, Efficiency, Cost-Savings, Productivity, Safety) ☐ Employee Suggestion Programs	***Learning Opportunities*** ☐ Tuition Reimbursement ☐ Tuition Discounts ☐ Corporate Universities ☐ New Technology Training ☐ On-the-Job Learning ☐ Attendance at Outside Seminars and Conferences ☐ Access to Virtual Learning, Podcasts, Webinars ☐ Self-Development Tools ***Coaching/Mentoring*** ☐ Leadership Training ☐ Exposure to Resident Experts ☐ Access to Information Networks ☐ Formal or Informal ☐ Mentoring Programs ***Advancement Opportunities*** ☐ Internships ☐ Apprenticeships ☐ Overseas Assignments ☐ Internal Job Postings ☐ Job Advancement/ Promotion ☐ Career Ladders and Pathways ☐ Succession Planning ☐ On/Off Ramps through Career Lifecycle ☐ Job Rotations

Appendix 8: Some Limesurvey's facilities

Pre-visualization of a group of questions

Managing an envitation email

Appendix 9: Invitation to participate sent to the head of the company

Caro Fernando Belfo

O meu nome é Fernando Belfo e sou professor no ensino superior e investigador na área das tecnologias e dos sistemas de informação, podendo o meu percurso profissional e académico ser consultado na minha página pessoal. Estou a desenvolver uma pesquisa no âmbito do meu doutoramento na Universidade do Minho que aborda um dos temas que preocupa os gestores do negócio nas organizações e sobretudo os seus gestores de tecnologias da informação (TI): o alinhamento entre o negócio e as TI. Este alinhamento é visto como a medida de quanto a missão, os objetivos e os planos das TI numa organização suportam e são suportados pela missão, objetivos e planos de negócios. A preocupação dos gestores com o alinhamento, justifica-se pela convicção, já comprovada em anteriores estudos, de que a sua melhoria influenciará positivamente o desempenho do negócio. A minha investigação tem como objetivo principal uma melhor compreensão da influência dos diversos tipos de incentivos dados aos colaboradores duma média ou grande empresa portuguesa no alinhamento entre o negócio e as TI.

Peço-lhe alguns minutos do seu tempo (ou de outro gestor que considere adequado), para responder às perguntas deste inquérito enquanto responsável executivo da empresa ISCAC Business School, o qual, após umas breves questões sobre si e a sua empresa, o questionará sobre estes dois temas. Em primeiro lugar, sobre os vários incentivos que tem na sua empresa e, em segundo lugar, o seu entendimento sobre o grau de alinhamento do negócio na sua empresa com as TI. As suas respostas são muito importantes para a conclusão deste estudo que acredito irá contribuir para uma melhor utilização das tecnologias da informação enquanto vantagem competitiva das empresas. Após o processamento e análise de todos as respostas, as quais serão tratadas de forma anónima, terei o maior prazer em lhe enviar os resultados globais do estudo, os quais, estou certo, também lhe interessarão. Para além disso, comprometo-me ainda a fazer uma doação de 1 quilo/litro de um produto alimentar de primeira necessidade a uma Instituição de Solidariedade Social por cada resposta ao inquérito que receber. Assim, ao responder, também estará a contribuir para que isso aconteça. Este donativo será uma outra forma de lhe retribuir a sua importante colaboração.

Para participar, clique no seguinte endereço para aceder ao inquérito:

http://survey.iscac.pt/index.php?lang=pt&sid=21926&token=ikcqcxws3zegvbb

Obrigado pelo seu tempo e contribuição.

Com os melhores cumprimentos,

Fernando Paulo dos Santos Rodrigues Belfo (pbelfo@iscac.pt)

Universidade do Minho Escola de Engenharia — COIMBRA BUSINESS SCHOOL ISCAC.pt — FCT Fundação para a Ciência e a Tecnologia MINISTÉRIO DA EDUCAÇÃO E CIÊNCIA — CENTROALGORITMI

Se não quer participar deste inquérito e não deseja receber mais convites clique p.f. na seguinte ligação:
http://survey.iscac.pt/optout.php?lang=pt&sid=21926&token=ikcqcxws3zegvbb

Note: In this test example, three words are underlined and mean that they have a link to specific pages or that they invoke some services.

Appendix 10: Invitation to participate sent to a manager from LinkedIn

Caro Fernando Belfo

O meu nome é Fernando Belfo e com base na sua atual função, peço-lhe que responda a um inquérito que suporta um estudo que estou a desenvolver intitulado de "Influência da Política de Incentivos no Alinhamento entre Negócio e TI". Através da recente ligação que entre nós existe na rede LinkedIn, tive a oportunidade de consultar a sua significativa experiência profissional, em especial, enquanto quadro superior da empresa ISCAC Business School, estando certo que essa experiência valorizará este estudo.

Sou professor no ensino superior e investigador na área das tecnologias e dos sistemas de informação. O meu percurso profissional e académico poderá ser consultado na minha página pessoal ou através da ligação que partilho consigo no LinkedIn. Elaborei este questionário, no qual o convido a participar, como parte duma pesquisa no âmbito do meu doutoramento na Universidade do Minho, que aborda um dos temas que mais preocupa os gestores de tecnologias da informação (TI): o alinhamento entre o negócio e as TI. Este alinhamento é visto como a medida de quanto a missão, os objetivos e os planos das TI numa organização suportam e são suportados pela missão, objetivos e planos de negócios. A preocupação destes gestores com o alinhamento, justifica-se pela convicção, já comprovada em anteriores estudos, de que a sua melhoria influenciará positivamente o desempenho do negócio. A minha investigação tem como objetivo principal uma melhor compreensão da influência dos diversos tipos de incentivos dados aos colaboradores duma média ou grande empresa portuguesa no alinhamento entre o negócio e as TI.

Peço-lhe alguns minutos do seu tempo para responder às perguntas deste inquérito, o qual, após umas breves questões sobre si e a sua empresa, o questionará sobre estes dois temas. Em primeiro lugar, sobre os vários incentivos que tem na sua empresa e, em segundo lugar, o seu entendimento sobre o grau de alinhamento do negócio com as TI na sua empresa. As suas respostas são muito importantes para a conclusão deste estudo que acredito irá contribuir para uma melhor utilização das tecnologias da informação enquanto vantagem competitiva das empresas. Após o processamento e análise de todos as respostas, as quais serão tratadas de forma anónima, terei o maior prazer em lhe enviar os resultados globais do estudo, os quais, estou certo, também lhe interessarão. Para além disso, comprometo-me ainda a fazer uma doação de 1 quilo/litro de um produto alimentar de primeira necessidade a uma Instituição de Solidariedade Social por cada resposta ao inquérito que receber. Assim, ao responder, também estará a contribuir para que isso aconteça. Este donativo será uma outra forma de lhe retribuir a sua importante colaboração.

Para participar, clique no seguinte endereço para aceder ao inquérito:
http://survey.iscac.pt/index.php?lang=pt&sid=59188&token=npt4h74pyn9anpy

Obrigado pelo seu tempo e contribuição.

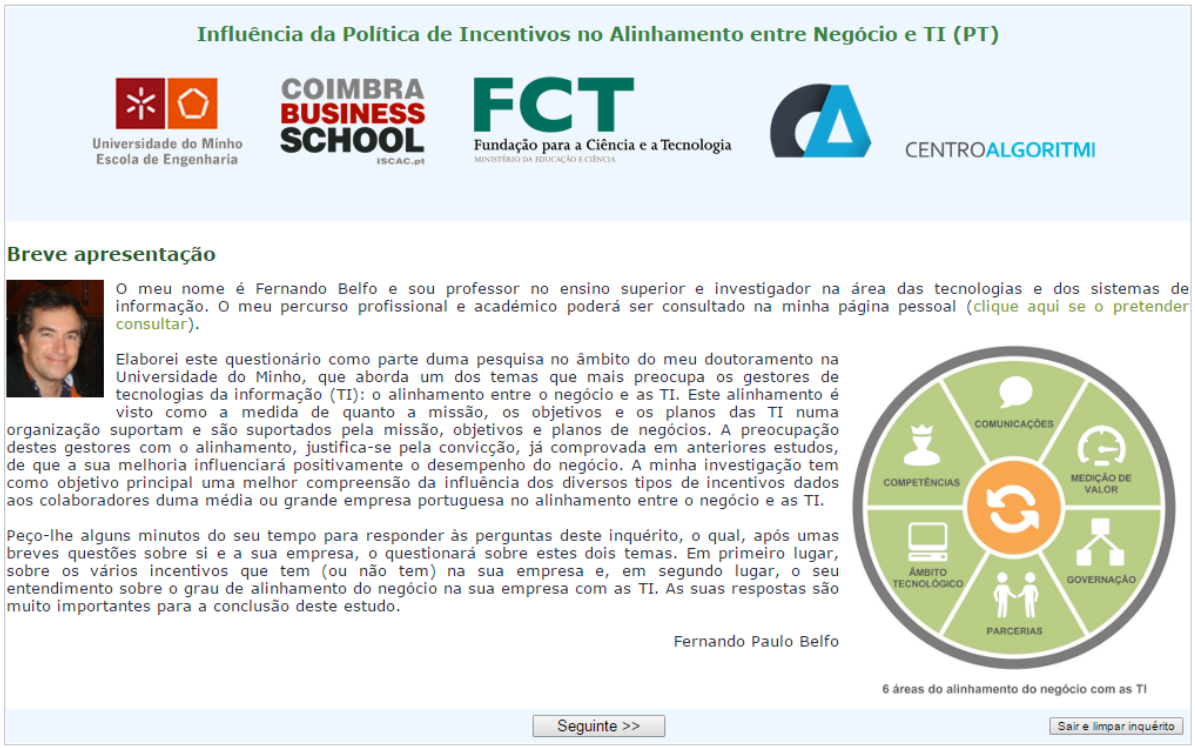
Com os melhores cumprimentos,

Fernando Paulo dos Santos Rodrigues Belfo (pbelfo@iscac.pt)

Universidade do Minho Escola de Engenharia · COIMBRA BUSINESS SCHOOL ISCAC.pt · FCT Fundação para a Ciência e a Tecnologia MINISTÉRIO DA EDUCAÇÃO E CIÊNCIA · CENTROALGORITMI

Se não quer participar deste inquérito e não deseja receber mais convites clique p.f. na seguinte ligação: http://survey.iscac.pt/optout.php?lang=pt&sid=59188&token=npt4h74pyn9anpy

Appendix 11: Final web survey version



Appendix 11: Final web survey version (continuation)

Influência da Política de Incentivos no Alinhamento entre Negócio e TI (FV)

Universidade do Minho Escola de Engenharia · COIMBRA BUSINESS SCHOOL ISCAC.pt · FCT Fundação para a Ciência e a Tecnologia · CENTROALGORITMI

0% 100%

Sobre si e a empresa onde trabalha

Apenas algumas questões sobre si e sobre a empresa onde trabalha.

* **Género**

- Feminino
- Masculino

* **Classe etária**

- menos do que 34 anos
- de 35 a 49 anos
- de 50 a 69 anos
- mais do que 69 anos

Preencha a sua classe etária de acordo com as alternativas disponíveis.

* **Função desempenhada na empresa**

Indique a função que desempenha atualmente na empresa onde trabalha.

* **Área da atividade económica da empresa**

- Actividades administrativas e dos serviços de apoio
- Agricultura, Produção Animal, Caça, Floresta e Pesca
- Alojamento, restauração e similares
- Atividades de Consultoria, técnicas e outras
- Atividades de informação e de comunicação
- Atividades Financeiras e de Seguros
- Atividades Imobiliárias
- Comércio (grosso e retalho); reparação de veículos
- Construção
- Educação, saúde e outras atividades de serviços
- Eletricidade, gás, vapor e água
- Indústrias Extrativas
- Industrias Transformadoras
- Transportes e armazenagem
- Outra

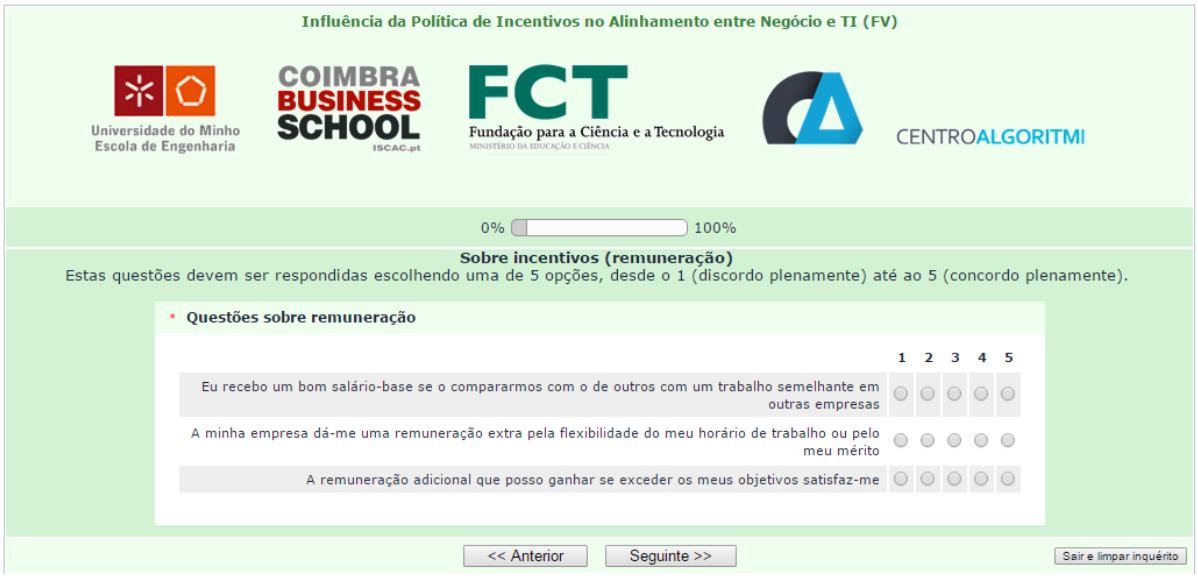
Relativamente à empresa onde trabalha, selecione a área da atividade económica que melhor a carateriza. No caso de nenhuma estar conforme, acrescente-a no final.

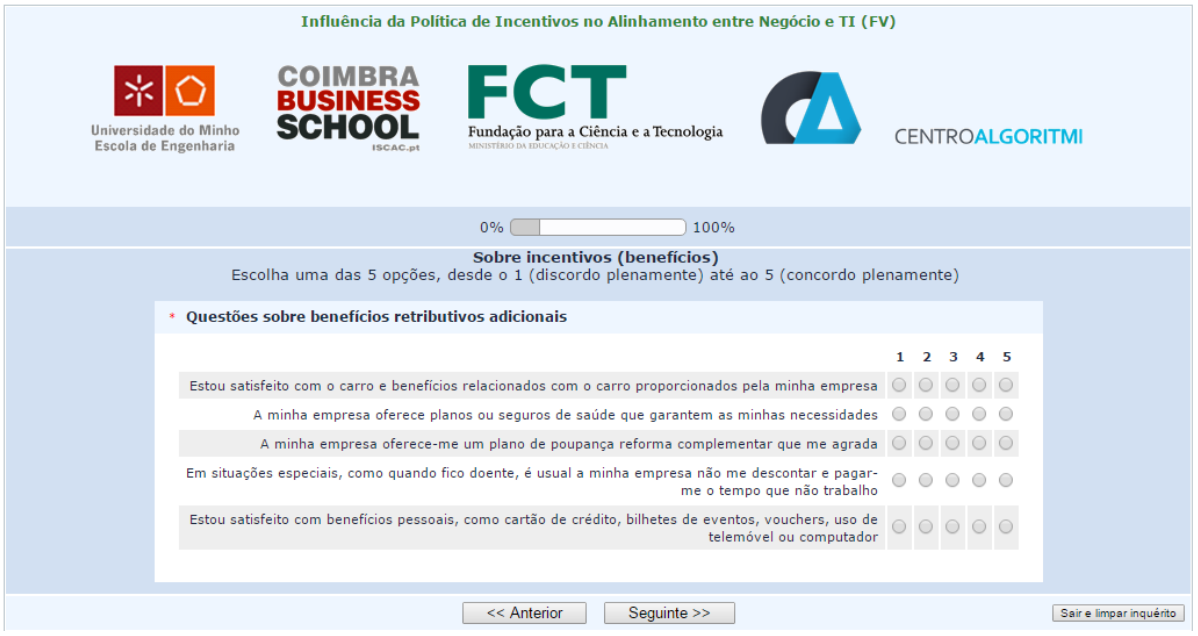
* **Tamanho da empresa**

- micro (1-9 trabalhadores e volume <= 2 milhões € ou balanço <= 2 milhões €)
- pequena (10-49 trabalhadores e negócios <= 10 milhões € ou balanço <= 10 milhões €)
- média (50-249 trabalhadores e volume <= 50 milhões € ou balanço <= 43 milhões €)
- grande A (250-999 trabalhadores e volume > 50 milhões € e balanço > 43 milhões €)
- grande B (1000-4999 trabalhadores e volume > 50 milhões € e balanço > 43 milhões €)
- grande C (>= 5000 trabalhadores e negócios > 50 milhões € e balanço > 43 milhões €)

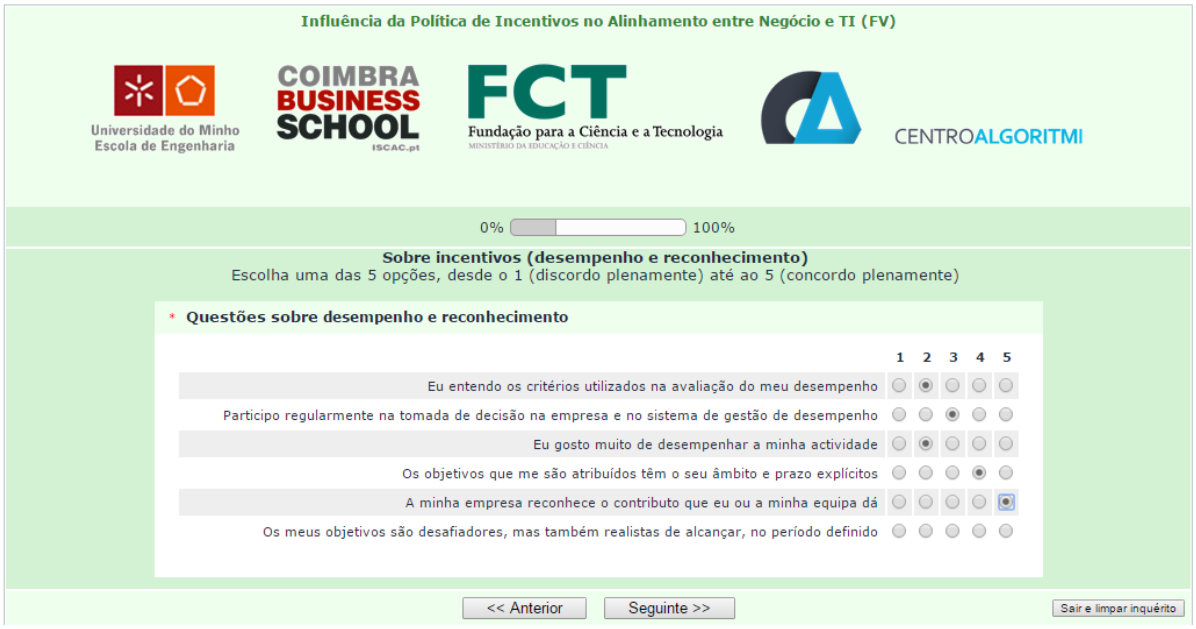
<< Anterior · Seguinte >> · Sair e limpar inquérito

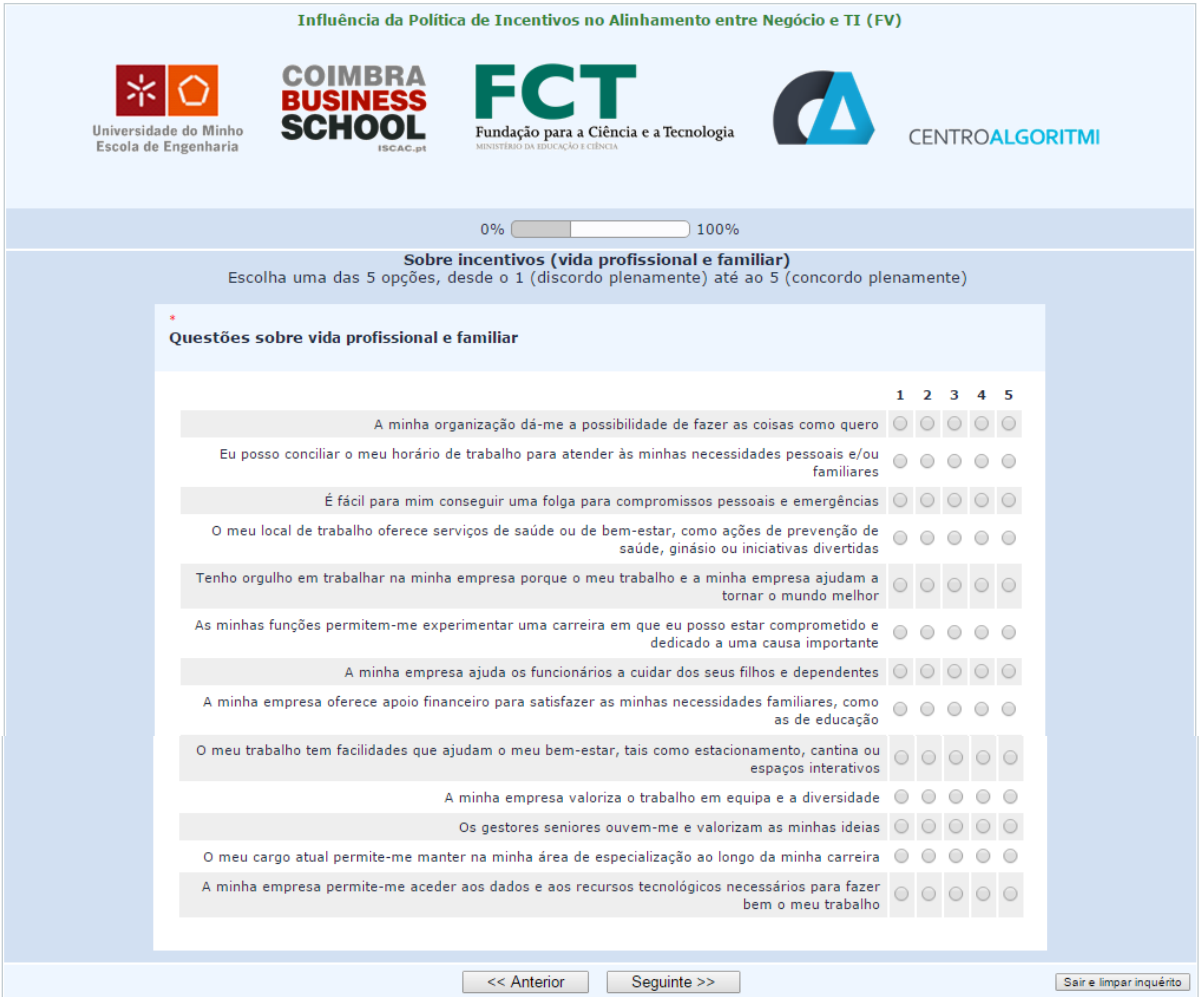
Appendix 11: Final web survey version (continuation)



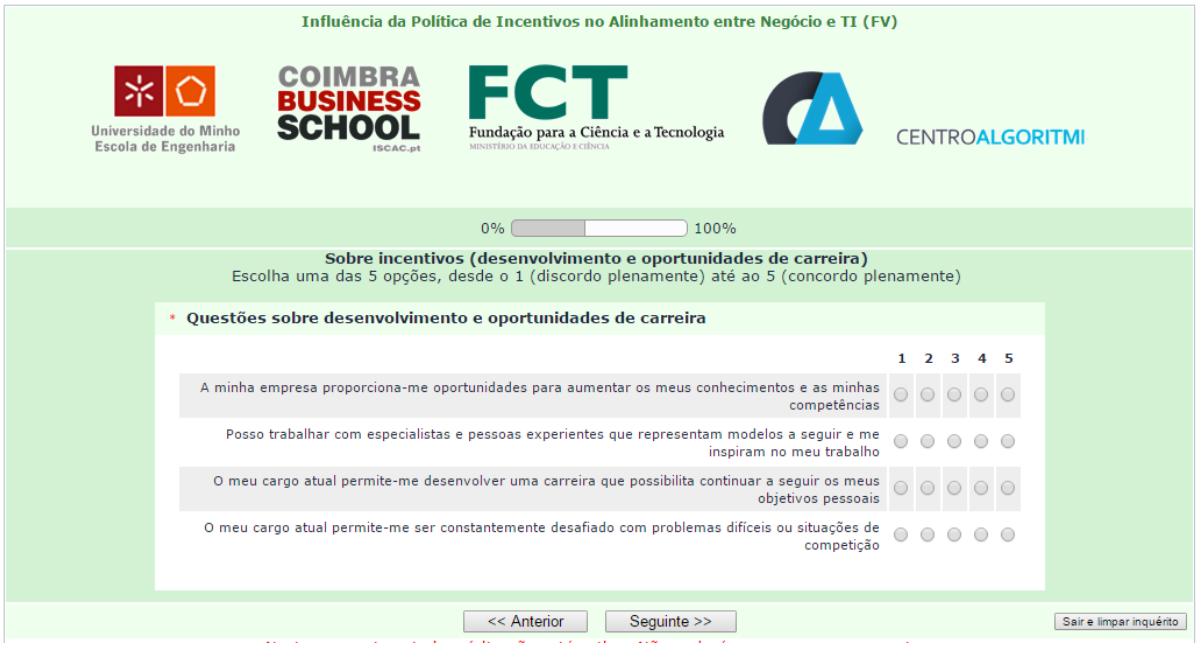


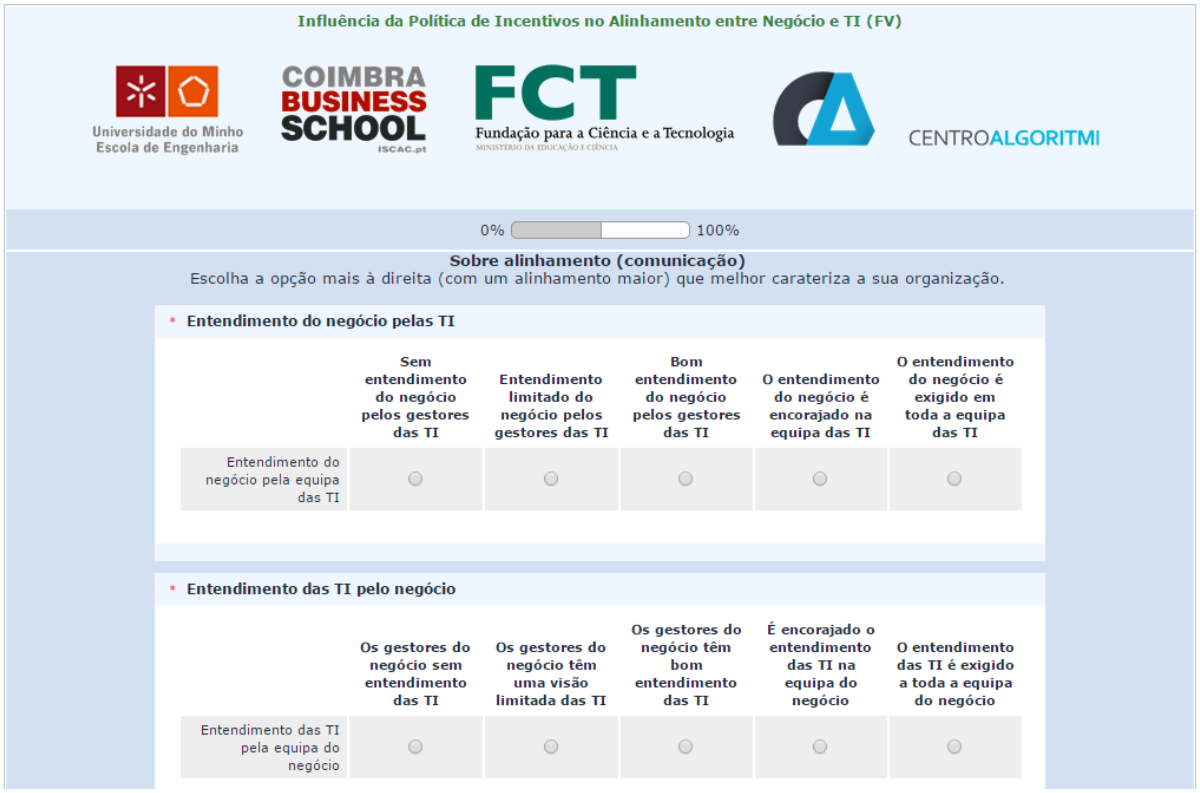
Appendix 11: Final web survey version (continuation)



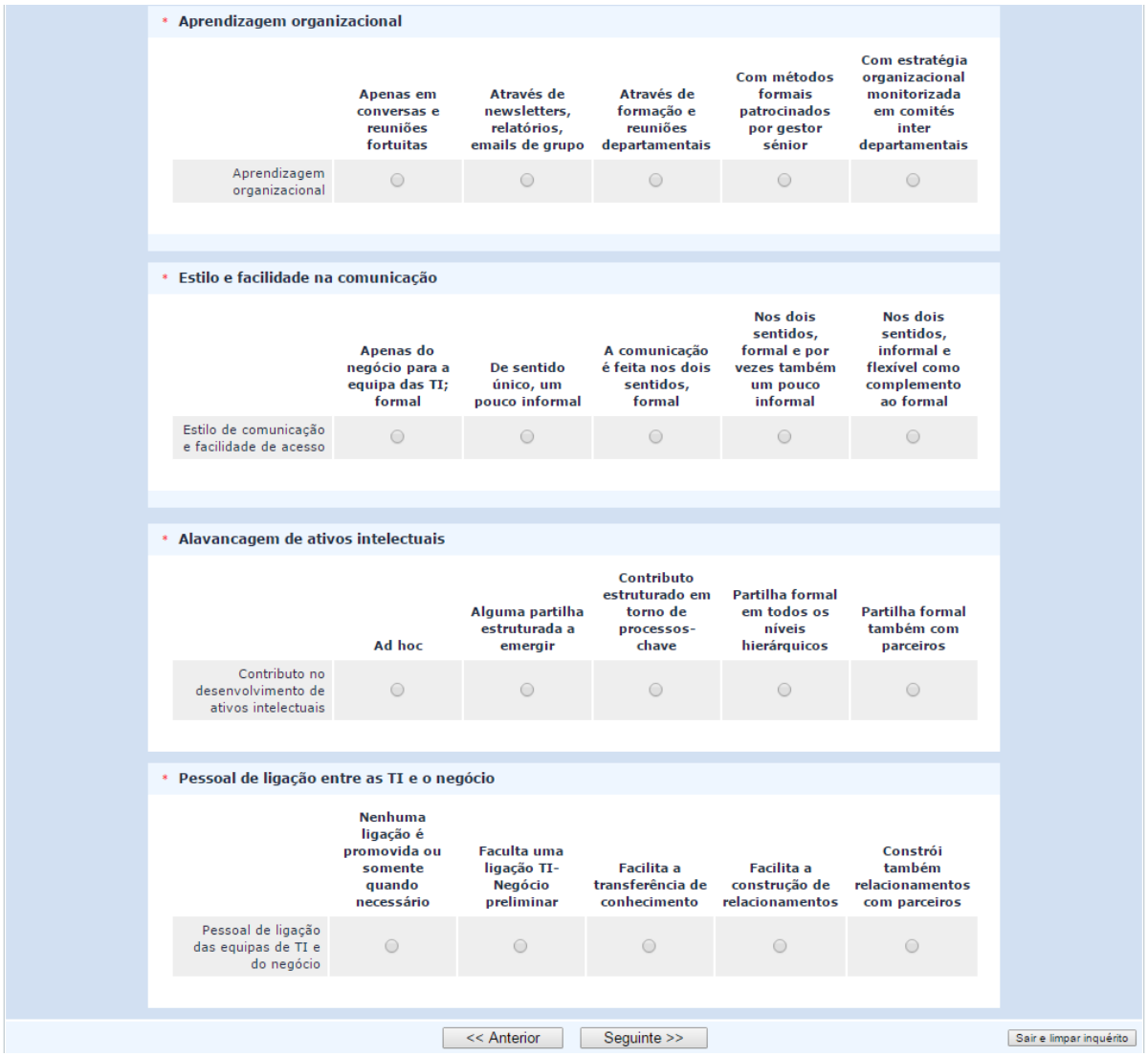


Appendix 11: Final web survey version (continuation)





Appendix 11: Final web survey version (continuation)



* Aprendizagem organizacional

	Apenas em conversas e reuniões fortuitas	Através de newsletters, relatórios, emails de grupo	Através de formação e reuniões departamentais	Com métodos formais patrocinados por gestor sénior	Com estratégia organizacional monitorizada em comités inter departamentais
Aprendizagem organizacional	○	○	○	○	○

* Estilo e facilidade na comunicação

	Apenas do negócio para a equipa das TI; formal	De sentido único, um pouco informal	A comunicação é feita nos dois sentidos, formal	Nos dois sentidos, formal e por vezes também um pouco informal	Nos dois sentidos, informal e flexível como complemento ao formal
Estilo de comunicação e facilidade de acesso	○	○	○	○	○

* Alavancagem de ativos intelectuais

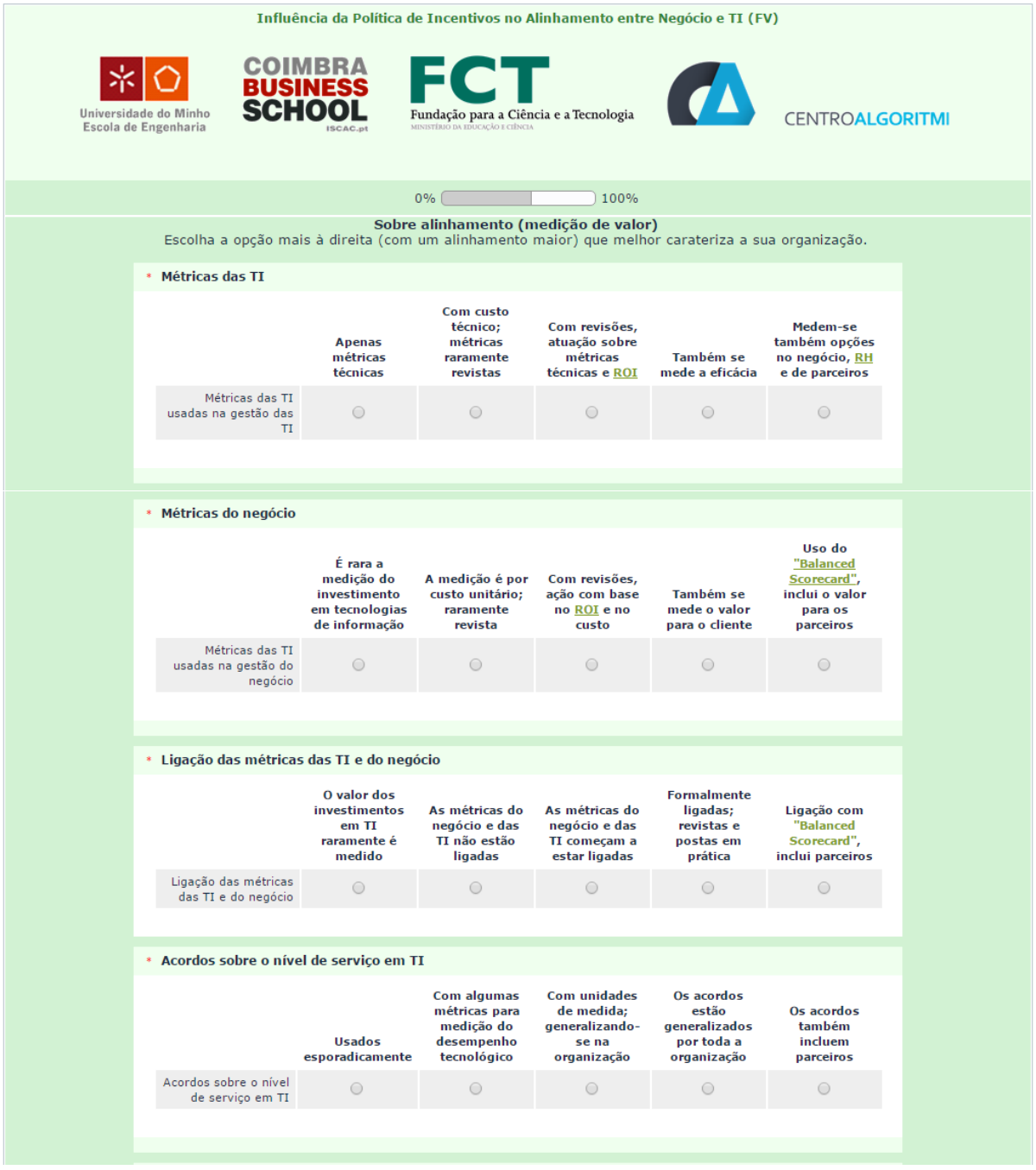
	Ad hoc	Alguma partilha estruturada a emergir	Contributo estruturado em torno de processos-chave	Partilha formal em todos os níveis hierárquicos	Partilha formal também com parceiros
Contributo no desenvolvimento de ativos intelectuais	○	○	○	○	○

* Pessoal de ligação entre as TI e o negócio

	Nenhuma ligação é promovida ou somente quando necessário	Faculta uma ligação TI-Negócio preliminar	Facilita a transferência de conhecimento	Facilita a construção de relacionamentos	Constrói também relacionamentos com parceiros
Pessoal de ligação das equipas de TI e do negócio	○	○	○	○	○

<< Anterior Seguinte >> Sair e limpar inquérito

Appendix 11: Final web survey version (continuation)



Influência da Política de Incentivos no Alinhamento entre Negócio e TI (FV)

Universidade do Minho Escola de Engenharia

COIMBRA BUSINESS SCHOOL ISCAC.pt

FCT Fundação para a Ciência e a Tecnologia MINISTÉRIO DA EDUCAÇÃO E CIÊNCIA

CENTROALGORITMI

0% 100%

Sobre alinhamento (medição de valor)

Escolha a opção mais à direita (com um alinhamento maior) que melhor carateriza a sua organização.

* **Métricas das TI**

	Apenas métricas técnicas	Com custo técnico; métricas raramente revistas	Com revisões, atuação sobre métricas técnicas e ROI	Também se mede a eficácia	Medem-se também opções no negócio, RH e de parceiros
Métricas das TI usadas na gestão das TI	○	○	○	○	○

* **Métricas do negócio**

	É rara a medição do investimento em tecnologias de informação	A medição é por custo unitário; raramente revista	Com revisões, ação com base no ROI e no custo	Também se mede o valor para o cliente	Uso do "Balanced Scorecard", inclui o valor para os parceiros
Métricas das TI usadas na gestão do negócio	○	○	○	○	○

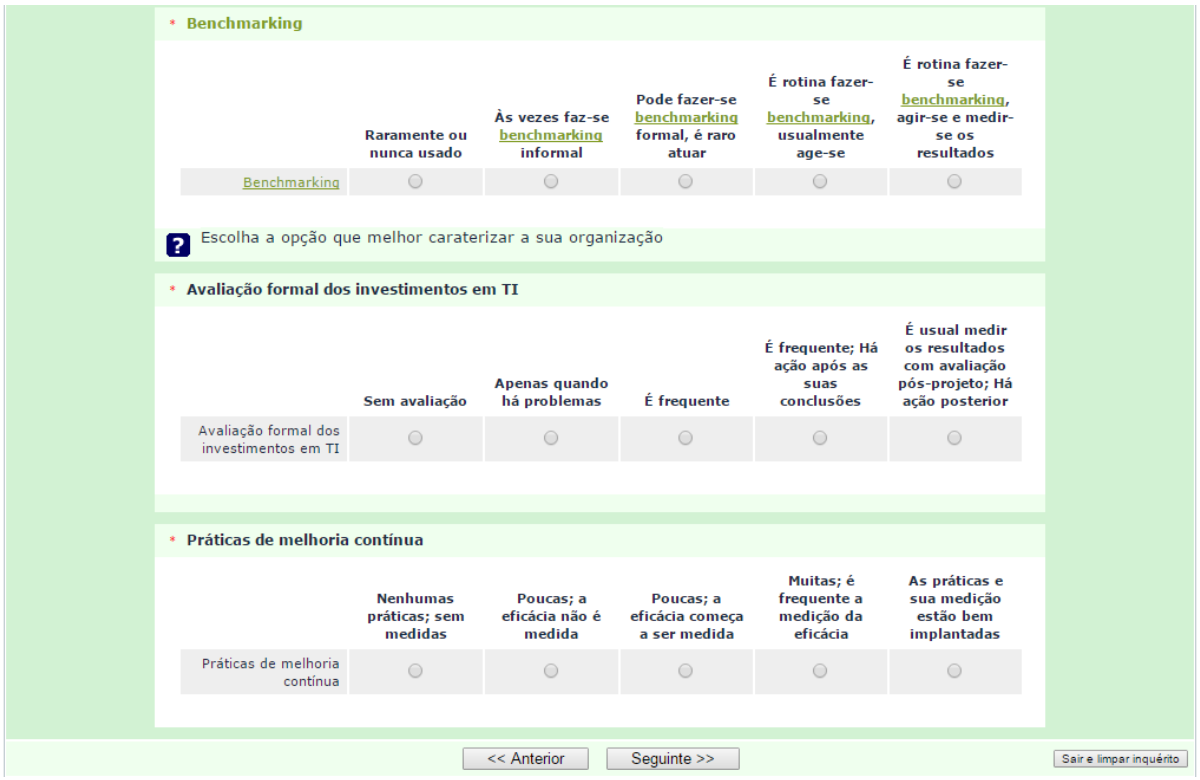
* **Ligação das métricas das TI e do negócio**

	O valor dos investimentos em TI raramente é medido	As métricas do negócio e das TI não estão ligadas	As métricas do negócio e das TI começam a estar ligadas	Formalmente ligadas; revistas e postas em prática	Ligação com "Balanced Scorecard", inclui parceiros
Ligação das métricas das TI e do negócio	○	○	○	○	○

* **Acordos sobre o nível de serviço em TI**

	Usados esporadicamente	Com algumas métricas para medição do desempenho tecnológico	Com unidades de medida; generalizando-se na organização	Os acordos estão generalizados por toda a organização	Os acordos também incluem parceiros
Acordos sobre o nível de serviço em TI	○	○	○	○	○

Appendix 11: Final web survey version (continuation)



* Benchmarking

	Raramente ou nunca usado	Às vezes faz-se benchmarking informal	Pode fazer-se benchmarking formal, é raro atuar	É rotina fazer-se benchmarking, usualmente age-se	É rotina fazer-se benchmarking, agir-se e medir-se os resultados
Benchmarking	○	○	○	○	○

? Escolha a opção que melhor caraterizar a sua organização

* Avaliação formal dos investimentos em TI

	Sem avaliação	Apenas quando há problemas	É frequente	É frequente; Há ação após as suas conclusões	É usual medir os resultados com avaliação pós-projeto; Há ação posterior
Avaliação formal dos investimentos em TI	○	○	○	○	○

* Práticas de melhoria contínua

	Nenhumas práticas; sem medidas	Poucas; a eficácia não é medida	Poucas; a eficácia começa a ser medida	Muitas; é frequente a medição da eficácia	As práticas e sua medição estão bem implantadas
Práticas de melhoria contínua	○	○	○	○	○

<< Anterior Seguinte >> Sair e limpar inquérito

Influência da Política de Incentivos no Alinhamento entre Negócio e TI (FV)

Universidade do Minho Escola de Engenharia · COIMBRA BUSINESS SCHOOL ISCAC.pt · FCT Fundação para a Ciência e a Tecnologia · CENTROALGORITMI

0% 100%

Sobre alinhamento (governação)

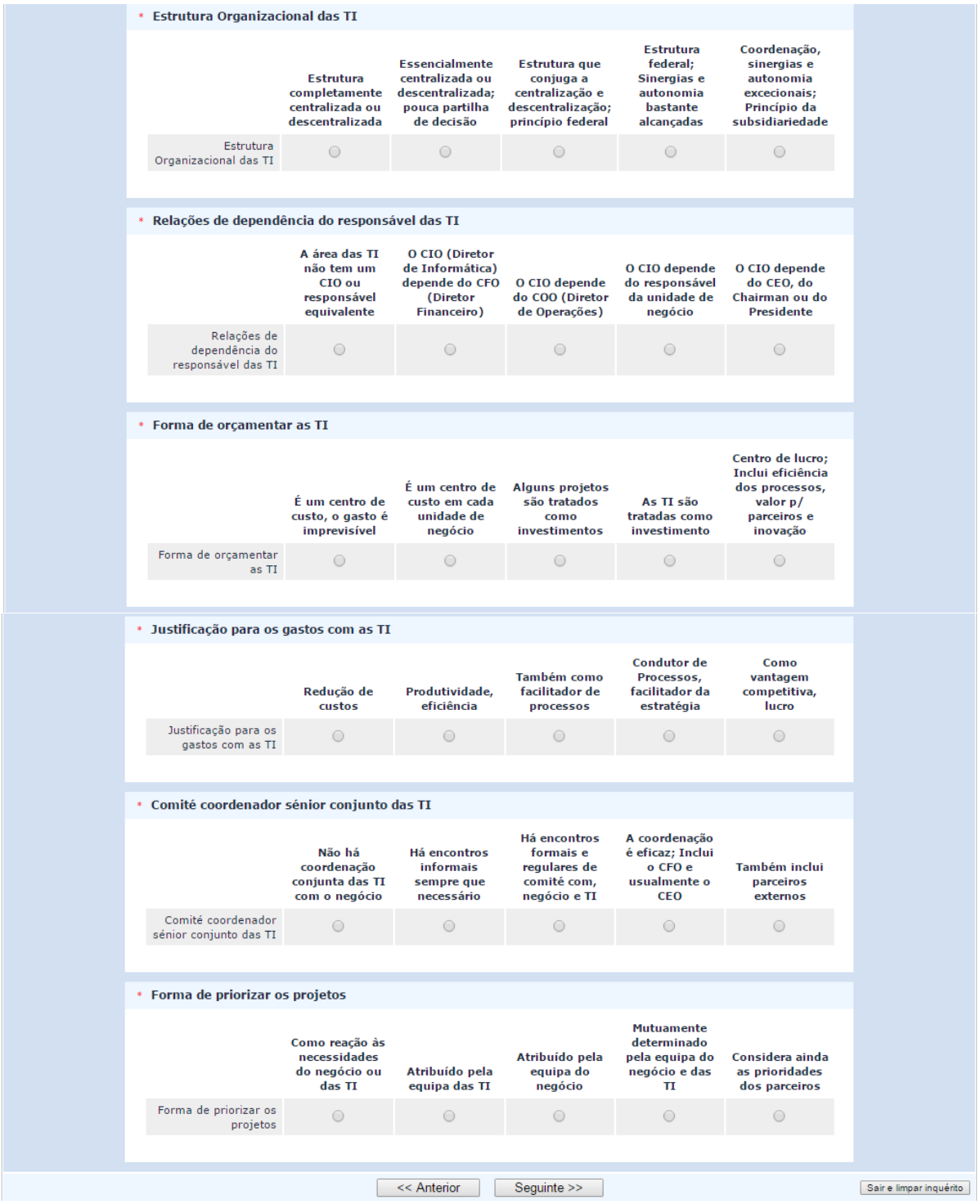
* Planeamento formal da estratégia do negócio

	Planeamento por fazer, ou feito quando é preciso	Ao nível do departamento, pouco contributo da equipa das TI	Algum contributo das TI e com planeamento interdepartamental	Ao nível da unidade de negócio e da empresa e com a equipa das TI	Com a equipa das TI e também com os parceiros
Planeamento formal da estratégia do negócio	○	○	○	○	○

* Planeamento formal da estratégia das TI

	Planeamento por fazer, ou feito quando é preciso	Ao nível do departamento, pouco envolvimento do negócio	Algum contributo do negócio e planeamento interdepartamental	Ao nível organizacional, em comité estratégico com CEO, negócio e TI	Também com os parceiros
Planeamento formal da estratégia das TI	○	○	○	○	○

Appendix 11: Final web survey version (continuation)



* Estrutura Organizacional das TI

	Estrutura completamente centralizada ou descentralizada	Essencialmente centralizada ou descentralizada; pouca partilha de decisão	Estrutura que conjuga a centralização e descentralização; princípio federal	Estrutura federal; Sinergias e autonomia bastante alcançadas	Coordenação, sinergias e autonomia excecionais; Princípio da subsidiariedade
Estrutura Organizacional das TI					

* Relações de dependência do responsável das TI

	A área das TI não tem um CIO ou responsável equivalente	O CIO (Diretor de Informática) depende do CFO (Diretor Financeiro)	O CIO depende do COO (Diretor de Operações)	O CIO depende do responsável da unidade de negócio	O CIO depende do CEO, do Chairman ou do Presidente
Relações de dependência do responsável das TI					

* Forma de orçamentar as TI

	É um centro de custo, o gasto é imprevisível	É um centro de custo em cada unidade de negócio	Alguns projetos são tratados como investimentos	As TI são tratadas como investimento	Centro de lucro; Inclui eficiência dos processos, valor p/ parceiros e inovação
Forma de orçamentar as TI					

* Justificação para os gastos com as TI

	Redução de custos	Produtividade, eficiência	Também como facilitador de processos	Condutor de Processos, facilitador da estratégia	Como vantagem competitiva, lucro
Justificação para os gastos com as TI					

* Comité coordenador sénior conjunto das TI

	Não há coordenação conjunta das TI com o negócio	Há encontros informais sempre que necessário	Há encontros formais e regulares de comité com, negócio e TI	A coordenação é eficaz; Inclui o CFO e usualmente o CEO	Também inclui parceiros externos
Comité coordenador sénior conjunto das TI					

* Forma de priorizar os projetos

	Como reação às necessidades do negócio ou das TI	Atribuído pela equipa das TI	Atribuído pela equipa do negócio	Mutuamente determinado pela equipa do negócio e das TI	Considera ainda as prioridades dos parceiros
Forma de priorizar os projetos					

<< Anterior Seguinte >> Sair e limpar inquérito

Appendix 11: Final web survey version (continuation)

Influência da Política de Incentivos no Alinhamento entre Negócio e TI (FV)

Universidade do Minho Escola de Engenharia

COIMBRA BUSINESS SCHOOL ISCAC.pt

FCT Fundação para a Ciência e a Tecnologia MINISTÉRIO DA EDUCAÇÃO E CIÊNCIA

CENTROALGORITMI

0% 100%

Sobre alinhamento (parceria entre a equipa do negócio e das TI)

* Papel das TI segundo a equipa do negócio

	As TI são vistas como custo ao fazer o negócio	As TI estão-se a tornar uma mais-valia	As TI facilitam o futuro da actividade do negócio	As TI impulsionam o futuro da actividade do negócio	O pessoal das TI é um parceiro do negócio na criação de valor
Papel das TI segundo a equipa do negócio	○	○	○	○	○

* Papel das TI no planeamento estratégico do negócio

	A equipa das TI não tem envolvimento	As TI facilitam os processos de negócio	As TI estimulam os processos de negócio	Facilitam e estimulam fortemente a estratégia do negócio	As TI e o negócio adaptam-se rapidamente à mudança
Papel das TI no planeamento estratégico do negócio	○	○	○	○	○

* Partilha de riscos e de recompensas nos projetos das TI

	A equipa das TI assume todos os riscos, sem qualquer recompensa	A equipa das TI assume a maioria dos riscos com pouca recompensa	As equipas das TI e do negócio começam a partilhar riscos e recompensas	Os riscos e as recompensas são bastante partilhados	Enorme cultura de partilha de riscos; Os gestores encorajados no assumir de riscos
Partilha de riscos e de recompensas nos projetos das TI	○	○	○	○	○

* Gestão das relações entre as equipas das TI e do negócio

	A relação entre as equipas das TI e do negócio não é gerida	Gerida numa base ad hoc	Existem processos, mas não são sempre cumpridos	Existem processos e são normalmente cumpridos	Os processos são continuamente melhorados
Gestão das relações entre as equipas das TI e do negócio	○	○	○	○	○

* Estilo de relacionamento e confiança

	Conflituoso e com desconfiança	Relacionamento transacional	As TI tornam-se um fornecedor de serviços valorizado	Parceria de longo prazo	Serviços de parceria, fornecedor de confiança
Estilo de relacionamento e confiança	○	○	○	○	○

Appendix 11: Final web survey version (continuation)

* Patrocinador ou patrono da área das TI na organização

	Geralmente não há nenhum patrocinador ou patrono das TI	Normalmente é um gestor sénior das TI que defende as TI	Patrocinador/ patrono comum para o negócio e TI ao nível da unidade	Patrocinador/ patrono comum para o negócio e TI ao nível corporativo	O CEO é o patrocinador/ patrono comum para o negócio e TI
Patrocinador ou patrono da área das TI na organização	○	○	○	○	○

Influência da Política de Incentivos no Alinhamento entre Negócio e TI (FV)

Sobre alinhamento (tecnologia)

* Sofisticação tecnológica e estratégica dos sistemas primários

	Sistema tradicional (ex: contabilidade ou email)	Sistema transacional (ex: ESS - Executive Support System)	Âmbito alargado (ex: facilitador de processos de negócio)	Âmbito redefinido (ex: impulsionador de processos de negócio)	Âmbito externo; impulsionador / facilitador da estratégia de negócio
Sofisticação tecnológica e estratégica dos sistemas primários	○	○	○	○	○

* Articulação e conformidade das normas das TI

	Nenhuma ou ad-hoc	Normas de TI adotadas a um nível funcional; Exemplos: ISO, COBIT, ITIL, TOGAF, SOX	Normas ao nível da unidade de negócio; a surgir a nível da empresa	Normas de TI estabelecidas ao nível da empresa	Normas interempresas estabelecidas, envolvendo parceiros externos
Articulação e conformidade das normas das TI	○	○	○	○	○

* Grau da integração arquitectural

	Sem integração formal	Tentativas iniciais de integração	Integração por toda a organização	Integração com parceiros	Evolução com os parceiros
Grau da integração arquitectural	○	○	○	○	○

* Grau da transparência da infra-estrutura

	Nenhuma	Limitada	Focada nas comunicações	Gestão eficaz da tecnologia emergente	Em toda a infra-estrutura
Grau da transparência da infra-estrutura	○	○	○	○	○

* Grau da flexibilidade da infra-estrutura

	Nenhuma	Limitada	Focada nas comunicações	Gestão eficaz da tecnologia emergente	Em toda a infra-estrutura
Grau da flexibilidade da infra-estrutura	○	○	○	○	○

Appendix 11: Final web survey version (continuation)

Influência da Política de Incentivos no Alinhamento entre Negócio e TI (FV)

Universidade do Minho Escola de Engenharia

COIMBRA BUSINESS SCHOOL ISCAC.pt

FCT Fundação para a Ciência e a Tecnologia MINISTÉRIO DA EDUCAÇÃO E CIÊNCIA

CENTROALGORITMI

0% 100%

Sobre alinhamento (competências)

* Ambiente inovador, empreendedor

	A inovação e o empreendedorismo são desencorajados	Ambiente relativamente incentivado ao nível da unidade de negócio	Muito incentivado ao nível da unidade de negócio	Incentivado também ao nível corporativo	Também envolve os parceiros
Ambiente inovador, empreendedor	○	○	○	○	○

* Quem toma as principais decisões de RH das TI

	A gestão de topo do negócio e das TI ao nível corporativo	Idem, com certa influência funcional	A gestão de topo e da unidade; com conselhos das TI	A gestão de topo e das TI em toda a empresa	A gestão de topo em toda a empresa e parceiros
Quem toma as principais decisões de RH das TI	○	○	○	○	○

* Disponibilidade para a mudança

	Tendência para resistir à mudança	Despontam programas de disponibilidade	Programas implementados a nível funcional	Programas implementados a nível corporativo	Também com proatividade e antecipação da mudança
Disponibilidade para a mudança	○	○	○	○	○

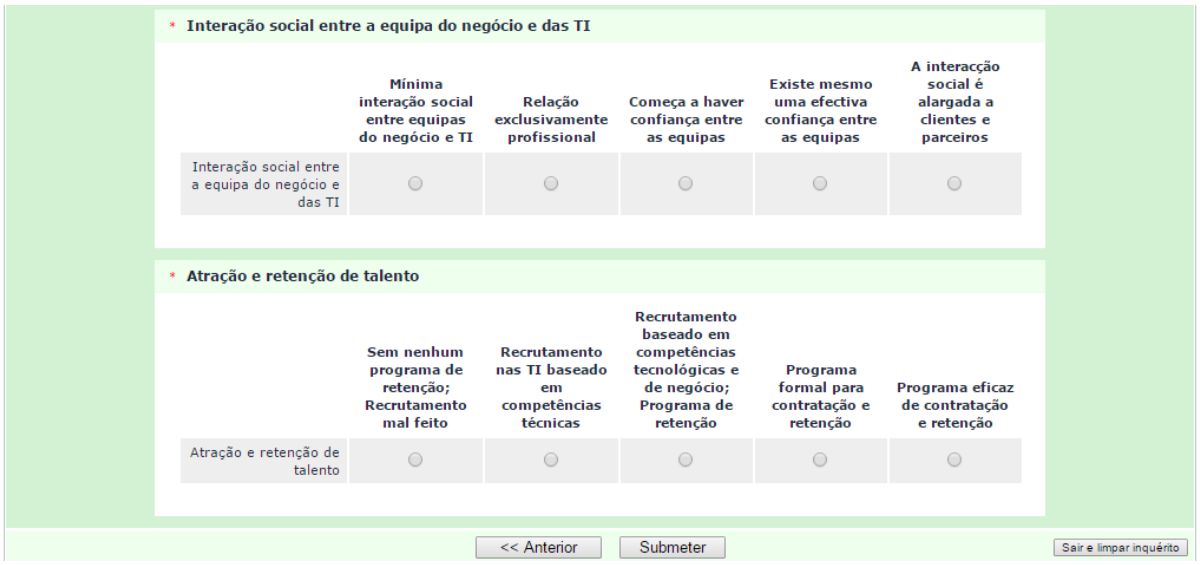
* Migração entre carreiras do negócio e das TI

	A migração entre carreiras é rara	A migração ocorre esporadicamente na unidade de negócio	A migração ocorre regularmente na unidade de negócio	A migração ocorre regularmente em todos os níveis da unidade	A migração ocorre também ao nível corporativo
Migração entre carreiras do negócio e das TI	○	○	○	○	○

* Formação interfuncional e rotação de funções

	Não existem oportunidades	Decidido isoladamente em cada unidade de negócio	Ocorrem programas formais em todas as unidades	Ocorrem por toda a empresa	Envolvem também os parceiros
Formação interfuncional e rotação de funções	○	○	○	○	○

Appendix 11: Final web survey version (continuation)



* Interação social entre a equipa do negócio e das TI

	Mínima interação social entre equipas do negócio e TI	Relação exclusivamente profissional	Começa a haver confiança entre as equipas	Existe mesmo uma efectiva confiança entre as equipas	A interacção social é alargada a clientes e parceiros
Interação social entre a equipa do negócio e das TI	○	○	○	○	○

* Atração e retenção de talento

	Sem nenhum programa de retenção; Recrutamento mal feito	Recrutamento nas TI baseado em competências técnicas	Recrutamento baseado em competências tecnológicas e de negócio; Programa de retenção	Programa formal para contratação e retenção	Programa eficaz de contratação e retenção
Atração e retenção de talento	○	○	○	○	○

<< Anterior Submeter Sair e limpar inquérito

Appendix 12: Reminder to participate in the survey

Caro(a) <first name>

Recentemente, foi convidado a participar num inquérito.

Notamos que ainda não completou o inquérito, e queremos relembrar que o inquérito ainda está disponível, caso queira tomar parte dele.

O inquérito tem o título:
"Influência da Política de Incentivos no Alinhamento entre Negócio e TI (teste)"

ISCAC
Instituto Superior de Contabilidade e Administração de Coimbra

FCT
Fundação para a Ciência e a Tecnologia
MINISTÉRIO DA EDUCAÇÃO E CIÊNCIA

Universidade do Minho
Escola de Engenharia

CENTROALGORITMI

Para participar, por favor, carregue no seguinte endereço:
http://survey.iscac.pt/index.php?lang=pt&sid=98256&token=23pcgu96va5sfby

Com os melhores cumprimentos,

Fernando Paulo dos Santos Rodrigues Belfo (pbelfo@iscac.pt)

Se não quer participar deste inquérito e não deseja receber mais convites clique p.f. na seguinte ligação:
http://survey.iscac.pt/optout.php?lang=pt&sid=98256&token=23pcgu96va5sfby

Appendix 13: Email confirmation in the survey

Caro(a) <first name>

Este email confirma que completou o inquérito intitulado «Influência da Política de Incentivos no Alinhamento entre Negócio e TI» e que as suas respostas foram gravadas. Agradeço a sua participação.

Se tiver qualquer questão relacionada com este inquérito, por favor, contacte-me através do meu endereço eletrónico pbelfo@iscac.pt.

Com os melhores cumprimentos,

Fernando Paulo dos Santos Rodrigues Belfo

Appendix 14: Cross loadings of the model - A

Item	BNF	C&V	CMP	COM	D&C	GOV	P&R	PRT	SKL	TEC	WKL
A01	0,3219	0,4406	0,3248	0,6840	0,4662	0,5789	0,3901	0,5520	0,4709	0,4506	0,4684
A02	0,2600	0,4287	0,3407	0,6858	0,4292	0,4538	0,4203	0,4859	0,4408	0,4098	0,4221
A03	0,3736	0,5826	0,4730	0,7630	0,4606	0,5773	0,4911	0,5377	0,5816	0,5132	0,4549
A04	0,3545	0,4931	0,3509	0,7650	0,4638	0,5551	0,4541	0,5475	0,4735	0,4376	0,4922
A05	0,2998	0,6199	0,3535	0,7193	0,5058	0,5121	0,5203	0,5312	0,5860	0,4704	0,4834
A06	0,3999	0,6247	0,4178	0,8302	0,5544	0,6563	0,5391	0,6248	0,5936	0,5646	0,5921
A07	0,2828	0,8285	0,3025	0,6223	0,3767	0,6435	0,4047	0,6510	0,5971	0,5892	0,3750
A08	0,2835	0,8515	0,2932	0,5548	0,3458	0,6179	0,4042	0,6036	0,5702	0,5746	0,4255
A09	0,3201	0,8568	0,3721	0,6044	0,3463	0,6562	0,3894	0,6582	0,6223	0,6331	0,3693
A10	0,3389	0,8282	0,3401	0,5911	0,3381	0,6132	0,4048	0,5589	0,6186	0,6164	0,3850
A11	0,3730	0,7545	0,3447	0,5306	0,3400	0,6289	0,4423	0,6096	0,5476	0,5679	0,3902
A12	0,3682	0,8482	0,4061	0,6233	0,3940	0,7135	0,4544	0,7202	0,7028	0,6761	0,4453
A13	0,2455	0,7798	0,3258	0,6234	0,4416	0,5682	0,4871	0,5985	0,5854	0,5372	0,4782
A14	0,3342	0,6263	0,3861	0,6726	0,5331	0,8093	0,5052	0,6492	0,5744	0,5772	0,5185
A15	0,3773	0,6724	0,4184	0,6389	0,4843	0,8618	0,5001	0,6907	0,5882	0,5656	0,4905
A16	0,3233	0,6157	0,3138	0,5459	0,3375	0,7562	0,3512	0,6393	0,5793	0,5393	0,3692
A17	0,2162	0,3233	0,1961	0,3528	0,3119	0,4656	0,3036	0,4200	0,3023	0,3509	0,3428
A18	0,2977	0,5609	0,3034	0,5527	0,3196	0,7331	0,3317	0,5795	0,5246	0,5348	0,3301
A19	0,3232	0,5539	0,3646	0,6270	0,4728	0,7705	0,4933	0,6476	0,6509	0,5688	0,4404
A20	0,2696	0,6653	0,3193	0,5529	0,3824	0,8138	0,4314	0,7010	0,5943	0,5745	0,4142
A21	0,3732	0,6029	0,3907	0,5882	0,4440	0,8101	0,4311	0,6823	0,5515	0,5890	0,4340
A22	0,3325	0,5930	0,3836	0,6239	0,3868	0,7173	0,4258	0,8050	0,6254	0,5745	0,3968
A23	0,3706	0,6222	0,3333	0,6426	0,4528	0,7563	0,4403	0,8466	0,6543	0,5921	0,4315
A24	0,3506	0,5886	0,3853	0,5260	0,4228	0,6061	0,5287	0,7715	0,6413	0,5420	0,4265
A25	0,3659	0,6682	0,3526	0,6186	0,4658	0,6645	0,5290	0,8392	0,6234	0,6512	0,4949
A26	0,3286	0,6453	0,3278	0,6097	0,4520	0,5975	0,5103	0,7817	0,6522	0,6087	0,4790
A27	0,2949	0,5282	0,3009	0,4773	0,4103	0,5816	0,4622	0,7107	0,5630	0,5386	0,3891
A28	0,2801	0,6187	0,3293	0,5070	0,3348	0,6077	0,3146	0,5795	0,5943	0,7633	0,3189
A29	0,3335	0,6193	0,3160	0,4842	0,3165	0,5383	0,3510	0,5779	0,5437	0,7695	0,3279
A30	0,2833	0,5551	0,3358	0,4858	0,3092	0,5739	0,3376	0,6276	0,6006	0,8094	0,3196
A31	0,3148	0,5459	0,3630	0,5385	0,4274	0,5382	0,4302	0,5681	0,5582	0,8125	0,4728
A32	0,3085	0,5654	0,3240	0,5371	0,4373	0,5613	0,4173	0,5754	0,6095	0,8177	0,3994
A33	0,3605	0,6028	0,4178	0,6235	0,5152	0,6378	0,4854	0,6190	0,7886	0,5724	0,5031
A34	0,2276	0,3971	0,1781	0,3836	0,3140	0,4979	0,3219	0,4604	0,4434	0,4735	0,3056
A35	0,3316	0,5687	0,4045	0,5761	0,3842	0,5924	0,4203	0,6529	0,7961	0,6734	0,3995
A36	0,2275	0,6202	0,2752	0,4914	0,3621	0,5677	0,3462	0,5831	0,7500	0,4856	0,3569
A37	0,3426	0,5666	0,3308	0,4968	0,4280	0,5053	0,4323	0,5775	0,7809	0,5003	0,3746
A38	0,2867	0,5135	0,2780	0,5399	0,4217	0,4964	0,4192	0,6066	0,7114	0,5861	0,4346
A39	0,4194	0,5683	0,4409	0,5674	0,4831	0,5876	0,4682	0,6295	0,8197	0,5777	0,4727

Appendix 14: Cross loadings of the model - A (continuation)

Item	BNF	C&V	CMP	COM	D&C	GOV	P&R	PRT	SKL	TEC	WKL
I01	0,4395	0,3233	0,7443	0,4143	0,4030	0,3327	0,4289	0,3449	0,3961	0,3157	0,4052
I02	0,4891	0,3268	0,8608	0,4076	0,4608	0,3951	0,5049	0,3587	0,3425	0,3176	0,4267
I03	0,5627	0,3879	0,8926	0,4547	0,4832	0,3968	0,5727	0,3905	0,4262	0,4118	0,4707
I04	0,8057	0,2870	0,5415	0,3415	0,3578	0,2976	0,4810	0,3137	0,2933	0,2808	0,4107
I05	0,3446	0,2973	0,3712	0,2657	0,3514	0,3018	0,3071	0,2843	0,3130	0,3163	0,3375
I06	0,3947	0,2605	0,3254	0,2560	0,2625	0,2810	0,2771	0,2156	0,3061	0,2822	0,2931
I29	0,7431	0,2959	0,3749	0,3288	0,3266	0,3076	0,3491	0,3143	0,2951	0,3141	0,2977
I30	0,8743	0,3500	0,5209	0,4243	0,4713	0,3919	0,5286	0,4070	0,4274	0,3367	0,4951
I07	0,4209	0,3775	0,4965	0,4729	0,5392	0,3619	0,7751	0,4373	0,4221	0,3163	0,5872
I08	0,4466	0,4544	0,4583	0,5126	0,6018	0,4474	0,7856	0,5067	0,4393	0,3671	0,6149
I09	0,2939	0,2766	0,2880	0,3209	0,4280	0,3105	0,4765	0,3280	0,2782	0,2088	0,4018
I10	0,4643	0,4647	0,5105	0,5378	0,6235	0,4890	0,8196	0,5223	0,5066	0,4364	0,5723
I11	0,5298	0,4010	0,5208	0,5249	0,6196	0,4164	0,8441	0,4889	0,4375	0,4030	0,6905
I31	0,4371	0,4043	0,4644	0,5228	0,6213	0,5124	0,8243	0,5018	0,4395	0,3599	0,6322
I12	0,3457	0,2352	0,3138	0,3875	0,5048	0,3107	0,5459	0,3413	0,3310	0,2604	0,5022
I13	0,3275	0,1286	0,2551	0,2905	0,4021	0,1402	0,3956	0,2040	0,2203	0,1473	0,4635
I14	0,2723	0,0992	0,2234	0,2338	0,3365	0,1418	0,3485	0,1535	0,2432	0,1510	0,4235
I15	0,2923	0,3066	0,2954	0,3958	0,3705	0,3348	0,3963	0,3034	0,3839	0,2926	0,5403
I16	0,3923	0,3792	0,3471	0,4374	0,5929	0,3668	0,5536	0,3867	0,3709	0,3469	0,7591
I17	0,3658	0,3790	0,3835	0,4887	0,5934	0,3950	0,6063	0,4090	0,3668	0,2965	0,7961
I18	0,3690	0,3421	0,3282	0,3740	0,4609	0,3657	0,3720	0,3347	0,3925	0,3364	0,6006
I19	0,4520	0,3217	0,3176	0,3282	0,3424	0,4048	0,2540	0,3537	0,3781	0,3568	0,3787
I20	0,3206	0,2973	0,3159	0,3895	0,4459	0,3102	0,4263	0,2841	0,3282	0,2985	0,6628
I21	0,4600	0,4653	0,5354	0,6368	0,6635	0,5135	0,6733	0,5005	0,5320	0,4091	0,8194
I22	0,4293	0,3949	0,4274	0,5628	0,7055	0,4586	0,7314	0,4820	0,4506	0,3540	0,8318
I23	0,3289	0,2520	0,3727	0,4383	0,6207	0,3124	0,5513	0,3511	0,3368	0,2899	0,6863
I24	0,3201	0,4174	0,3428	0,5133	0,6542	0,4515	0,5461	0,4696	0,4441	0,4038	0,7362
I25	0,4235	0,4159	0,4808	0,5977	0,8689	0,4725	0,6550	0,5058	0,5070	0,4227	0,7287
I26	0,4308	0,4188	0,4793	0,5640	0,8776	0,4742	0,6616	0,4731	0,4889	0,4461	0,7020
I27	0,4128	0,3781	0,4771	0,5769	0,9115	0,4769	0,6655	0,4722	0,4973	0,3740	0,7294
I28	0,3975	0,3277	0,4170	0,4887	0,7807	0,4247	0,5699	0,4192	0,4275	0,3347	0,6130

Appendix 15: Cross loadings of the model - B

Item	BNF	C&V	CMP	COM	D&C	GOV	P&R	PRT	SKL	TEC	WKL
A01	0,3213	0,4405	0,3247	0,6826	0,4662	0,5790	0,3903	0,5518	0,4708	0,4506	0,4685
A02	0,2598	0,4288	0,3404	0,6859	0,4292	0,4538	0,4201	0,4858	0,4407	0,4097	0,4226
A03	0,3740	0,5826	0,4722	0,7635	0,4607	0,5773	0,4913	0,5377	0,5816	0,5133	0,4548
A04	0,3533	0,4931	0,3511	0,7647	0,4640	0,5551	0,4545	0,5475	0,4734	0,4375	0,4920
A05	0,3003	0,6200	0,3531	0,7204	0,5056	0,5121	0,5200	0,5315	0,5861	0,4704	0,4836
A06	0,3994	0,6247	0,4175	0,8302	0,5542	0,6563	0,5391	0,6250	0,5934	0,5646	0,5919
A07	0,2823	0,8285	0,3021	0,6226	0,3767	0,6435	0,4048	0,6511	0,5971	0,5893	0,3744
A08	0,2831	0,8516	0,2932	0,5551	0,3456	0,6178	0,4042	0,6037	0,5703	0,5747	0,4249
A09	0,3201	0,8568	0,3717	0,6046	0,3462	0,6561	0,3895	0,6583	0,6224	0,6334	0,3689
A10	0,3385	0,8282	0,3398	0,5914	0,3380	0,6133	0,4048	0,5590	0,6187	0,6165	0,3846
A11	0,3735	0,7545	0,3446	0,5308	0,3401	0,6288	0,4426	0,6097	0,5477	0,5681	0,3902
A12	0,3673	0,8479	0,4062	0,6233	0,3940	0,7134	0,4542	0,7202	0,7028	0,6763	0,4446
A13	0,2456	0,7801	0,3254	0,6237	0,4415	0,5681	0,4870	0,5986	0,5854	0,5372	0,4779
A14	0,3342	0,6263	0,3867	0,6725	0,5332	0,8090	0,5051	0,6491	0,5745	0,5772	0,5183
A15	0,3772	0,6724	0,4184	0,6387	0,4844	0,8615	0,5005	0,6906	0,5881	0,5657	0,4904
A16	0,3230	0,6156	0,3141	0,5460	0,3373	0,7560	0,3513	0,6392	0,5794	0,5395	0,3688
A18	0,2969	0,5609	0,3033	0,5525	0,3197	0,7333	0,3320	0,5795	0,5246	0,5349	0,3297
A19	0,3226	0,5538	0,3643	0,6268	0,4729	0,7708	0,4934	0,6476	0,6508	0,5690	0,4400
A20	0,2689	0,6652	0,3191	0,5528	0,3823	0,8139	0,4319	0,7010	0,5943	0,5747	0,4137
A21	0,3732	0,6028	0,3907	0,5878	0,4441	0,8102	0,4314	0,6821	0,5514	0,5892	0,4333
A22	0,3322	0,5930	0,3835	0,6236	0,3869	0,7174	0,4260	0,8050	0,6253	0,5746	0,3965
A23	0,3698	0,6222	0,3331	0,6424	0,4528	0,7563	0,4404	0,8464	0,6543	0,5922	0,4314
A24	0,3503	0,5885	0,3853	0,5263	0,4228	0,6061	0,5289	0,7720	0,6414	0,5421	0,4263
A25	0,3660	0,6682	0,3528	0,6186	0,4659	0,6645	0,5292	0,8392	0,6234	0,6512	0,4950
A26	0,3286	0,6453	0,3272	0,6097	0,4520	0,5975	0,5101	0,7822	0,6521	0,6086	0,4793
A27	0,2941	0,5282	0,3005	0,4770	0,4101	0,5816	0,4622	0,7098	0,5629	0,5388	0,3895
A28	0,2797	0,6187	0,3288	0,5069	0,3347	0,6077	0,3144	0,5794	0,5942	0,7641	0,3184
A29	0,3332	0,6192	0,3154	0,4844	0,3164	0,5384	0,3513	0,5779	0,5437	0,7699	0,3279
A30	0,2830	0,5550	0,3359	0,4857	0,3093	0,5740	0,3378	0,6275	0,6005	0,8095	0,3193
A31	0,3149	0,5459	0,3629	0,5386	0,4274	0,5382	0,4302	0,5682	0,5581	0,8118	0,4722
A32	0,3079	0,5653	0,3242	0,5371	0,4373	0,5613	0,4174	0,5754	0,6093	0,8170	0,3984
A33	0,3598	0,6027	0,4177	0,6234	0,5154	0,6378	0,4853	0,6190	0,7884	0,5724	0,5028
A35	0,3313	0,5686	0,4040	0,5761	0,3842	0,5925	0,4202	0,6529	0,7958	0,6734	0,3991
A36	0,2275	0,6202	0,2746	0,4918	0,3621	0,5678	0,3464	0,5832	0,7504	0,4858	0,3562
A37	0,3419	0,5666	0,3302	0,4971	0,4280	0,5054	0,4324	0,5776	0,7812	0,5004	0,3739
A38	0,2862	0,5134	0,2776	0,5400	0,4216	0,4965	0,4188	0,6066	0,7112	0,5859	0,4342
A39	0,4187	0,5682	0,4405	0,5675	0,4831	0,5877	0,4681	0,6297	0,8197	0,5779	0,4721

Appendix 15: Cross loadings of the model - B (continuation)

Item	BNF	C&V	CMP	COM	D&C	GOV	P&R	PRT	SKL	TEC	WKL
I01	0,4404	0,3233	0,7407	0,4144	0,4031	0,3328	0,4287	0,3449	0,3960	0,3158	0,4049
I02	0,4894	0,3267	0,8632	0,4076	0,4608	0,3950	0,5047	0,3588	0,3424	0,3175	0,4268
I03	0,5634	0,3878	0,8935	0,4547	0,4831	0,3968	0,5725	0,3905	0,4262	0,4118	0,4704
I04	0,8100	0,2870	0,5411	0,3417	0,3580	0,2975	0,4812	0,3138	0,2932	0,2808	0,4115
I29	0,7406	0,2958	0,3747	0,3286	0,3266	0,3077	0,3491	0,3142	0,2950	0,3141	0,2968
I30	0,8722	0,3499	0,5212	0,4241	0,4714	0,3919	0,5287	0,4070	0,4274	0,3366	0,4942
I07	0,4209	0,3775	0,4966	0,4732	0,5390	0,3619	0,7729	0,4374	0,4220	0,3163	0,5875
I08	0,4466	0,4544	0,4581	0,5129	0,6020	0,4473	0,7859	0,5068	0,4393	0,3669	0,6158
I10	0,4647	0,4647	0,5104	0,5379	0,6235	0,4890	0,8195	0,5223	0,5066	0,4364	0,5729
I11	0,5301	0,4010	0,5211	0,5250	0,6195	0,4164	0,8450	0,4890	0,4375	0,4029	0,6913
I31	0,4376	0,4043	0,4644	0,5229	0,6213	0,5124	0,8253	0,5018	0,4395	0,3598	0,6332
I16	0,3928	0,3793	0,3474	0,4375	0,5926	0,3667	0,5539	0,3868	0,3709	0,3468	0,7605
I17	0,3665	0,3790	0,3836	0,4888	0,5933	0,3950	0,6066	0,4090	0,3668	0,2964	0,7979
I18	0,3675	0,3421	0,3283	0,3739	0,4606	0,3657	0,3720	0,3347	0,3925	0,3362	0,5956
I20	0,3205	0,2973	0,3154	0,3895	0,4458	0,3102	0,4261	0,2842	0,3282	0,2984	0,6594
I21	0,4601	0,4653	0,5354	0,6369	0,6636	0,5134	0,6731	0,5006	0,5319	0,4091	0,8189
I22	0,4292	0,3949	0,4272	0,5628	0,7055	0,4585	0,7318	0,4819	0,4505	0,3539	0,8327
I23	0,3295	0,2520	0,3723	0,4381	0,6210	0,3123	0,5516	0,3510	0,3367	0,2898	0,6896
I24	0,3199	0,4174	0,3422	0,5131	0,6540	0,4514	0,5463	0,4696	0,4440	0,4036	0,7361
I25	0,4232	0,4159	0,4810	0,5978	0,8684	0,4725	0,6549	0,5057	0,5069	0,4227	0,7286
I26	0,4302	0,4189	0,4793	0,5641	0,8773	0,4741	0,6616	0,4731	0,4889	0,4460	0,7020
I27	0,4124	0,3781	0,4770	0,5769	0,9113	0,4769	0,6657	0,4722	0,4973	0,3738	0,7303
I28	0,3974	0,3277	0,4169	0,4886	0,7819	0,4246	0,5703	0,4193	0,4275	0,3346	0,6143